MONTHLY REPORT

OF

THE DEPARTMENT OF AGRICULTURE,

FOR

NOVEMBER AND DECEMBER,

1868.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1869.

MONTHLY REPORT.

WASHINGTON, D. C., *December* 31, 1868.

SIR: I herewith respectfully submit for publication a statement of the condition of the crops for November, with data bearing upon agricultural production, received in December, including estimates in detail of the corn and cotton crops of the year. I also present the following additional matter: Report of Professor John Gamgee on pleuro-pneumonia; Cereals for analysis; Condition and prospects of southern agriculture; Potatoes, yield of varieties; The Scuppernong grape; Is Texas a wine land? Insects injurious to the grape; Locusts or grasshoppers in Kansas; Humboldt county, Nevada; Yuba county, California; The diffusion process in sugar-making; English cotton for 1868; Agricultural colleges and model farms; Coal-ashes as a fertilizer; Agricultural statistics of Australia; American corn in Prussia.

J. R. DODGE, *Statistician.*

Hon. HORACE CAPRON, *Commissioner.*

CONDITION OF THE CROPS.

Reports have been made upon the condition of farm crops from month to month, and estimates calculated upon some of the principal products. The year has been one of more than average prosperity, as has been shown by previous exhibits. The tables of the present month make a comparison with last year, as to corn, cotton, tobacco, potatoes, hay, buckwheat, flax, sorghum, sugar cane, grapes, apples, and pears. These comparisons, giving due weight to all local or other circumstances affecting them, and making allowance for any errors or misconceptions, are calculated and set down in figures. The detailed statements of the estimated product of corn and cotton are given in the present number.

CORN.—We are unable to figure out the thousand millions of bushels promised by sanguine calculators. A handsome increase upon last year of 137,000,000 bushels, if not all that could be desired at the present time, affords an aggregate 67,000,000 bushels larger than in 1859, (without including the Pacific States, which are unsuited to corn production,) but a decrease in proportion to population. Illinois of course heads the list of States, with about one-seventh of the entire production, and an increase of about 16 per cent. in nine years—a good result, though barely abreast with the increase of population. The following is the estimate:

	Bushels.
Maine	1,590,000
New Hampshire	1,511,000
Vermont	1,672,000
Massachusetts	2,292,000
Rhode Island	346,000
Connecticut	2,152,000
New York	20,910,000
New Jersey	10,216,000

	Bushels.
Pennsylvania	31,979,000
Delaware	3,275,000
Maryland	12,349,000
Virginia	19,969,000
North Carolina	23,366,000
South Carolina	9,870,000
Georgia	27,294,000
Florida	2,950,000
Alabama	31,240,000
Mississippi	35,519,000
Louisiana	17,397,000
Texas	21,337,000
Arkansas	32,449,000
Tennessee	54,772,000
West Virginia	7,695,000
Kentucky	58,187,000
Missouri	60,967,000
Illinois	134,363,000
Indiana	90,832,000
Ohio	74,040,000
Michigan	18,815,000
Wisconsin	12,565,000
Minnesota	8,255,000
Iowa	65,332,000
Kansas	6,487,000
Nebraska	3,185,000
Total	905,178,000

COTTON.—Since the reception of the October returns local reports from the cotton section have been much more favorable, especially in the southwest, where the result in comparison with the acreage planted is better than in any preceding season since the trial of free labor. Picking has been unexpectedly prolonged, and the autumn favorable. While the area in cotton was somewhat less than in 1867, the culture was better, and in all the States west of Alabama the yield was far better, with less drawback and casualty, though the reverse was the case in all the more eastern cotton States. Yet it is the west that tells upon the result. Mississippi once produced nearly a million and a quarter of bales. The following estimate, which is assuredly below rather than above the actual yield, is not made for districts or cotton ports, as is generaly done in commercial reports, but for *States* separately:

	Bales.
North Carolina	140,000
South Carolina	180,000
Georgia	290,000
Florida	35,000
Alabama	285,000
Mississippi	400,000
Louisiana	250,000
Texas	260,000
Arkansas	265,000
Tennessee	200,000
Other States	75,000
Total	2,380,000

Table showing the condition of the crops, &c., on the 1st day of November, 1868.

STATES.	CORN.		POTATOES. (Solanum tuberosum.)		POTATOES. (Batatus edulis,) Sweet.		TOBACCO.		BEANS.	PEAS.
	Average product compared with 1867.	Quality of the same.	Average product compared with 1867.	Quality of the same.	Average product compared with 1867.	Quality of the same.	Average product compared with 1867.	Quality of the same.	Average product compared with 1867.	Average product compared with 1867.
Maine	10.1	9.7	12.1	11	.....	.....	.....	.....	13.6	9.7
New Hampshire	10.7	10.9	10	10.3	.....	.....	.....	.....	10.7	10
Vermont	11	10.6	10.8	10.6	.....	.....	.....	.....	10.6	10.3
Massachusetts	9.7	10	10.7	9.1	.....	.....	11.5	10	9.5	9.5
Rhode Island	10.2	10.2	10.2	9.5	10	10	.....	.....	10.5	8
Connecticut	9.6	11	11.3	10.6	.....	.....	10.6	11.3	8.3	7.5
New York	10.2	10.3	9.9	9.9	10.8	10.1	9.6	9.8	10.2	9.9
New Jersey	10.5	10.3	11	10.9	10.1	10.4	10	10	9.8	9.6
Pennsylvania	10.5	10.1	10.6	10.8	10.3	10.1	9.8	9.7	9.7	9.6
Delaware	9	10	11	10	9	10	.....	.....	9	10
Maryland	10.6	9.9	10	9.8	9.1	9.5	7.3	9	9.9	10.1
Virginia	10.8	10	9.2	9.2	9.8	9.3	10.4	9.4	9.7	10
North Carolina	13	10.9	10	9.8	9.4	9.2	10.2	10.1	10.4	12.3
South Carolina	12.6	10	9.4	9.8	10.1	9.5	10.2	10.2	10	10.8
Georgia	9.4	9.3	10.3	10	9.9	9.7	9.4	9.8	9.7	10.1
Florida	11.8	10.6	9.3	9.6	13	11	9.6	9.3	.....	11.2
Alabama	8.8	8.8	8.8	9	10.6	10	10.6	10.1	9.6	11.1
Mississippi	14	10.3	10.7	9.6	11.4	9.7	10.5	9.5	12	13.5
Louisiana	15.1	10.7	13.2	11.5	13.9	10.6	15.3	11.8	10	14
Texas	10.3	9.7	11.3	10.6	12.4	10.7	10.1	10.1	11	11.4
Arkansas	15	10	11.1	9.8	11	10	14.5	11	11.2	12.1
Tennessee	10.9	9.2	9.4	9.1	8.3	8.8	9.8	9.8	10	10.1
West Virginia	10.3	9.5	9.4	9.1	9.6	9.6	9.6	9.7	10.1	10.1
Kentucky	12.5	10.5	11.9	10.7	10.9	10.2	11.6	10.7	11	10.4
Missouri	10.7	9.1	9.5	9.3	10.1	9.6	9.4	8.9	10.1	10
Illinois	11.4	9	9.7	9.7	9.7	9.3	9.6	9.6	9.6	9.6
Indiana	11	8.5	10.4	9.9	9.8	10	9.8	9.8	9.2	9.4
Ohio	11.1	10.1	10.6	9.8	10.6	10.4	9.9	10.3	9.6	9.8
Michigan	9.8	9.6	9.7	9.4	9.5	9.7	9.8	9.9	9.4	9
Wisconsin	11.7	10.6	8.1	9	8.5	9	7.6	8	9.7	9.7
Minnesota	13.9	13.6	10.6	10	.....	.....	10.2	10.1	11.9	10.3
Iowa	11.5	9.4	10.6	10.2	9.7	9.7	9.7	8.8	9	9.3
Kansas	5.5	6.5	8	9	9.6	9.6	8.7	8.5	7.4	8.5
Nebraska	9.4	8	10.9	9	9.5	8	7	7.5	7.9	9
California	12.2	10.2	13.2	11.2	10.5	10.2	10.6	9.6	11.5	10.8

Condition of the crops, &c., on the 1st day of November, 1868—Continued.

STATES.	HAY.		BUCK-WHEAT.	FLAX.	COTTON.		SOR-GHUM.	SUGAR-CANE, (not sor-ghum.)	GRAPES	APPLES.	PEARS.
	Average product compared with 1867.	Quality of the same.	Average product compared with 1867.	Average product compared with 1867.	Average indicated product compared with 1867.	Average indicated product (lint) per acre, in pounds.	Average product compared with 1867.	Average indicated product compared with 1867.	Product compared with an average crop.	Product compared with an average crop.	Product compared with an average crop.
Maine	11.7	10.1	9.8	9.6	.....	.....	.....	.....	7.5	10.1	8.3
New Hamp..	11.5	11	9.6	.....	.....	.....	.....	.....	9	10.9	8.5
Vermont	10.1	8.5	7.5	9.5	.....	.....	.....	.....	10	8.6	9.5
Massachus'ts	11.7	9.2	8.8	.....	.....	.....	.....	.....	8	12	7.6
Rhode Island	10.7	11.2	10.5	.....	.....	.....	.....	.....	7.6	7.5	6
Connecticut	12.3	10	9.3	.....	.....	.....	7.6	.....	8.6	9	8
New York...	11.4	10.1	9	9.4	.....	.....	10	.....	10.5	8.7	8.6
New Jersey .	10.8	10.5	11	10	.....	.....	7	.....	8.1	3.2	5
Pennsylv'nia	10.1	10.1	9.3	9.5	.....	.....	7.5	.....	9.2	7.3	7.7
Delaware ...	11	10	11	10	.....	.....	5	.....	6	1	4
Maryland ...	10.3	10	9.5	10	.....	.....	9.7	.....	8.1	4	7.2
Virginia	10.1	10	11.2	9	.....	.....	9.1	.....	9.6	5.5	5
N. Carolina..	10.4	9.9	10.5	8.9	9.4	176	9.6	.....	6.5	10.3	10.8
S. Carolina ..	11.2	9.6	.....	.....	8	127	10.6	.....	7.3	8	9.5
Georgia	10.4	9.8	.....	.....	8	147	10.3	11.6	9.5	13.8	13.2
Florida	8.5	10	.....	.....	6	150	.....	13.1	.....	.....	.....
Alabama....	9.3	9.4	.....	.....	8	150	11.3	.....	9.5	12	9.9
Mississippi ..	10.7	10	10	.....	10.5	205	13.1	11	11.1	11	9.9
Louisiana...	9	8.6	.....	.....	17.3	266	14	22.5	16.2	11.5	15
Texas	10.2	9.8	.....	.....	13.3	277	10.9	11.5	19.2	11.3	10.5
Arkansas ...	10.5	9.3	.....	.....	12	300	13.3	.....	11.7	10	10.4
Tennessee ..	10.1	9.4	11	9.1	11.5	140	11.5	.....	9.4	8.8	7.5
W. Virginia .	9.1	9.8	9.5	9.7	.....	.....	9.8	.....	9.4	5.7	6.8
Kentucky ...	10.9	9.8	10.6	10	.....	.....	11.2	.....	9.1	6	6
Missouri	9.6	9.7	9.3	10	.....	.....	10.9	.....	11.1	7.5	7.8
Illinois	10	10.1	8	9.1	.....	.....	9.7	.....	10.6	4.6	6.3
Indiana.....	10.6	10.2	9.3	10.4	.....	.....	10.7	.....	10.3	4	7.2
Ohio	9.6	10.1	9.7	9.6	.....	.....	11	.....	9.2	7.5	8.1
Michigan...	10.7	10.1	9.8	12.2	.....	.....	9.4	.....	9.4	6.9	8
Wisconsin ..	9.3	10.2	8.9	9.7	.....	.....	6.7	.....	8.9	5.3	5.7
Minnesota ..	11.1	10.2	11	11.2	.....	.....	11.5	.....	10.5	10.2	.....
Iowa	10.4	10	8.2	9	.....	.....	11.1	.....	9.7	8.1	7.6
Kansas	7.3	9.2	7.5	7.4	.....	.....	8.6	.....	10.5	11.1	9.7
Nebraska ...	10.2	10	9.4	10.8	.....	.....	8.7	.....	9.2	8.5	9
California...	12.4	10.2	9.5	10.5	.....	.....	10	.....	10.1	10.2	10.7

EXTRACTS FROM CORRESPONDENCE.

PEACHES IN NEW JERSEY.

Morris county, N. J.—I have been engaged here since 1856 in the cultivation of nurseries and orchards, making the cultivation of peach trees a specialty. I find that new varieties, such as the Mountain Rose, Stephens's Rareripe, White Rareripe, Keyport White, &c., (all free-stone fruit,) are more profitable to cultivate than the old varieties, such as the Oldmixon, Crawford's Early, and late Malacatons, Walter's Early, Honest John, Smock Peach, Morris White, &c., the new varieties being the most productive, hardiest, and healthiest. The Pride of Essex (cling) is the largest white cling I have ever seen. I measured one that was over 12 inches in circumference; it is very sweet and juicy, ripening here about the 1st of October; very handsome, with a clear white skin. Peach trees are cultivated very extensively in this county, particularly in the townships of Morris, Mendham, and Passaic. We had good crops of peaches in 1862, 1863, 1864, and 1865, the last being very heavy. In 1866 the cold weather destroyed the fruit buds, causing an entire failure for that year; in 1867 the crop was light; this year there were only a few orchards that had any fruit on, and those were well protected from the east winds, being covered by heavy forests or high ground, situated on the side of hills. The Mountain Rose succeeded better than any other variety. I think the Mountain Rose is the best early variety cultivated; for flavor, color, productiveness, &c., it is unsurpassed. Apple trees and grapes were destroyed this year in consequence of the wet weather.

WINE AND FRUITS IN UTAH.

St. George, Utah.—We are now wine-making, and I think our little village will this year make near 4,000 gallons, and a considerable amount of raisins—and our colony is but eight years old. To-day I ate a pomegranate. We raise rice and sweet potatoes, and grow the tenderest grapes out of doors. Our season of heat is the greatest, longest, and most even, and the grapes the sweetest I have ever seen. The following data may be of interest: July 15, apricots ripe; June 15, thermometer up to 105 in the shade at noon; July 7, ripe figs; July 6, wall cherries ripe; July 8, Israella grape colors; July 8, tomatoes ripe; July 8, Codling and Sweet Bough ripe; July 10, first ripe peach; July 10, Japan lilies in bloom; July 12, white Chasselas grapes ripe; August 1, Old Mission begins to ripen; August 1, Black Hamburgs coloring; October 20, pomegranates ripe.

THE BLACK TARTARIAN CHERRY.

A correspondent writing from Germantown, in reference to the origin of this cherry, says:

Permit me, very respectfully, to call your attention to plate XI, page 147 of the Report for 1864, wherein a description of the "Black Tartarian cherry" is given, and the statement made that it came to this country "about 1806." I have seen the same quotation made by other writers, but I know of the fruit being in this country as early as 1790. The original tree was cut down about ten years ago, but grafts taken from it are now to be had. The engraving of the fruit in the report is much better than any I have seen before.

CORN.

Sagadahoc county, Me.—Corn would have been above the average had it not been for early frost, which was very severe on the nights of the 17th and 18th of September, but little corn being ripe at that time.

Burlington county, N. J.—I have never seen a better corn crop in our county and it ripened nicely before frost.

Indiana county, Pa.—The corn crop will be a short one; that is, for sound, merchantable corn. The frost of September did this damage. I think not more than a half crop will be saleable. The frost and the drouth have made a pretty short crop.

Baltimore county, Md.—The favorable weather, and the continued rain in due season, created a heavy crop of corn. Our crop is estimated at 1,400,000 bushels, the best yield since 1860.

Kanawha county, W. Va.—The corn crop, as to quantity, has exceeded expectation; but it is discovered that there will be considerable rotten corn amongst it, no doubt caused by the severe wet weather in September.

Bedford county, W. Va.—Corn greatly injured by drought, but the acreage being greater than last year, I estimate the crop at the same.

King George county, Va.—The corn has been mostly gathered in fine condition; the crop on good land, well cultivated, being the best for many years. The large quantity cultivated slovenly by the freedmen reduces considerably the average crop.

Middlesex county, Va.—The warm wet weather has considerably damaged the corn crop.

Duplin county, N. C.—Corn we have in plenty, for our own support, and a little to spare; the present year we have had to buy largely. The increased production is to be ascribed first to the season; secondly, better cultivation, and the large amount of cotton-seed used as manure.

Osage county, Kan.—The corn crop is only half that of 1867; it will in all probability not reach that amount. Many fields in this county will not yield five bushels per acre; and much of what is raised is eaten by worms. Up to July 1, the prospect was very flattering, but the extreme heat of that month injured it severely.

Stark county, Ohio.—Corn is good in quality and product where the first planting remained; where fields were injured by worms there is a large proportion of soft corn.

Madison county, Ark.—The continued rains during the past months of September and first of October, with heavy winds which have blown down the corn, have caused the larger portion of the crop to rot.

Greene county, Ga.—My corn crop exceeds anything of the kind that my eyes have ever beheld. I have a piece of river bottom that will yield 50 bushels to the acre, and I hope to sell 2,000 bushels this year.

Russell county, Ky.—The yield of corn has been better than for years past, but will not produce near as much money as last year. Corn sold last fall at 60 cents per bushel; corn can be bought now at from 25 to 30 cents.

McDonough county, Ill.—We had some severe frosts last month, which caused a good deal of injury to the late corn, which happened to be unseasonably green in consequence of September rains. Perhaps I overstate the injury, but farmers complain a good deal.

Warren county, Ill.—Our corn crop promised to be much larger than stated in my report, but was damaged and made lighter by the frosts, about the middle of September—except the earliest fields.

White county, Ind.—Corn crop seriously damaged by frost in September.

Marion county, Iowa.—Of corn there is a heavy yield, but it is somewhat injured by frost, being 10 days earlier than usual.

Fannin county, Texas.—Corn is not yielding as well as anticipated, having been injured by drought.

Walker county, Texas.—The corn crop of this county is equal to that of 1865, when little else was planted.

Grayson county, Texas.—The corn crop is short in consequence of the drought, both in quantity and quality, at least one half.

Ellis county, Texas.—Corn crop falls one-fourth below the expected yield, on account of the drought.

COTTON.

Beaufort county, N. C.—The crop of cotton is much better than in 1867, but the quantity planted is much less.

Franklin county, N. C.—It was at one time thought that the cotton crop would yield one-third less than last year, but it is coming in better than was anticipated, and the season has been of late favorable.

Duplin county, N. C.—Cotton is nearly all picked out, and we can estimate the crop with a degree of certainty. The yield is above an average one. The army worm appeared September 10, and ate the leaves entirely off of two-thirds of the cotton, but I don't think they injured it in the least. The rust also was very general but has not seemed to injure cotton to a great extent. Our cotton has opened much earlier than usual the present year. The freedmen have generally worked well and cheerfully, much better than the past year.

St. Clair county, Ala.—Cotton has been cut wonderfully short by the worms, worse than anticipated early in the season.

Randolph county, Ala.—The last days of August the worm stripped our cotton of leaves and all bolls not grown. More cotton planted in our county than ever before; bid fair for a good crop until the approach of the worm.

Putnam county, Ga.—The average yield of cotton is about a bale (450 to 500 pounds) to three acres. The late season has improved the crop somewhat since last return. The worms reached this county too late to materially injure the crop.

Stewart county, Ga.—The cotton crop was injured in early spring by protracted wet weather. This period of excessive rain was followed by one of drought of about nine weeks continuance. After this the caterpillar made its appearance, stripping entirely of its foliage most of the cotton in the county. In addition to this the boll worm has committed ravages to a most unprecedented extent, besides the average is not estimated at more than eight-tenths of 1867. All these unfavorable circumstances considered, it is no matter of surprise that the present crop should not exceed six-tenths of the crop of last year.

Holmes county, Miss.—Cotton is doing well in the way of opening, and the valley yield will be large compared with the two preceding years, but in the hill portion of the county the worms did a great deal of damage, and the crop is consequently short. I send you some cotton, a sample of my crop known as the Peeler long staple. All who have seen it say it is a decided improvement on the original. I purchased seed this year at $3 per bushel, and the variety of cotton is now selling at about 50 to 60 per cent. on common staple produced. I hope to make six, perhaps seven, bales off nine acres, and have, on the first picking, off of one and a half acres, obtained 1,240 pounds seed cotton. Deducting two thirds for seed, I have quite a commercial bale of lint cotton. I think it every way an improved variety. It is better limbed and better bolled, and though this has been a bad fall for cotton, and the worms injured it materially, yet if I had had seed at first to replant, and secure a good stand, I would have made over a bale to the acre.

Grayson county, Texas.—The cotton crop was also injured, first, by reason of the wet weather, then the drought, and to some extent by the caterpillar, so that the crop will not be more than two-thirds.

Walker county, Texas.—The cotton crop of this county this year is about equal to two-thirds of an average crop, being about double the amount raised last year.

Fayette county, Texas.—Cotton is a special crop in our county, and our planters are turning their attention to a small, curly prolific variety that will mature a crop by the first of September, thus in a great degree escaping the ravages of the worms. This cotton is yielding this year, on upland, three-quarters to a bale per acre, although the worms appeared in it the last week in August. The crop in the county will average a little over one-quarter of a bale per acre this year.

Sorghum is attracting considerable notice as a crop. It will yield, when properly cultivated and manufactured with the improved iron mills and evaporators, at each cutting, four barrels, of 40 gallons, of sirup, 50 gallons of superior vinegar, and 30 bushels of seed. The sirup is worth 80 cents (specie) per gallon; the vinegar 50 cents per gallon; and the seed 40 cents per bushel. It will make two crops in a year.

In the fruit line, peaches, plums, apricots, nectarines and pears thrive well and produce abundantly. The early varieties of apples will grow and produce some fruit. Small fruits, the blackberry, dewberry, and strawberry, thrive well. One of my neighbors has 1¼ acre in peach trees, from which he derives an annual profit of, say $500, besides supplying his own large family. They are seedlings, and it must be remembered that we have as yet no market for the fruit in its fresh state. When railroads penetrate into the interior of our State we will doubtless do well in producing early peaches for a more northern latitude, and sell at high rates.

Fannin county, Texas.—Cotton is not yielding as was expected; much of it was injured by caterpillars and boll-worms. Severe frost on the 5th and 6th instants destroyed a large amount of bolls, that of an ordinary season would have matured. Late cotton is very much injured. The owner of a field of 20 acres late cotton told me he would lose fully one-fourth, perhaps more, but there are not many such cases as that. The amount of cotton planted was greater this season than last, yet I think the crop will be lighter than most of men are willing to believe.

Arkansas county, Ark.—The crop of 1867 was a very bad one, and the average yield was less than 200 pounds of lint per acre; this year the average is less. One and one-fourth bale is the average amount of cotton picked to the hand, up to the present time; but I fear much cotton will be lost if the weather should be bad, in which event the crop may fall 20 to 30 per cent. below my estimate, and not above that of last year.

Ellis county, Texas.—Cotton grew well until the rain set in, followed by unusually hot weather, causing the cotton to shed all of its squares, or so nearly all that in many instances the ground was covered with the fallen squares; still we have an average yield.

Panola county, Miss.—The worm destroyed some cotton, but less in this county than in any other portion of the State.

Rutherford county, Tenn.—I am convinced that the estimate made August 1—16,200 bales as crop of this county will be near the mark; the staple is better than last year.

Clark county, Ark.—The drought in August materially lessened the cotton and corn crop, though a fair crop of each, at least double that of last year, has been made.

Prairie county, Ark.—The acreage planted in cotton was about 20 per cent. less than last year, yet the crop exceeds that of last year by about 100 per cent. The product of this county will be about 7,000 bales, against 3,400 last year.

Leon county, Fla.—The cotton crop is nearly gathered. I do not think there remain 50 bales to gather in the county. The crop was first shortened by a wet season, just as it got fairly to bearing, and then it was cut off earlier than ever before by the caterpillar.

POTATOES.

Addison county, Vt.—There were no potatoes of any account the middle of September, but from that time to the 15th or 20th of October they grew to be a fine crop both in quantity and quality.

Burlington county, N. J.—Early potatoes were light; late, heavy; in some localities a loss from rot, especially among Monitors, but not so much as last year; one large grower reports loss of one-third of his crop.

Delaware county, Penn.—In 1867, in this part of our State, we lost almost all our potatoes by rot. This season the crop was large where it was not destroyed by wet weather in the spring.

Indiana county, Penn.—Potatoes are about a half crop and in quality not a half crop.

Hancock county, Ill.—Potatoes yielded poorly and are quite deficient in quality.

Appanoose county, Iowa.—Potatoes were ruined by the bug.

Portage county, Ohio.—The great drought of July and August has injured the crops with us very much, but potatoes grew rapidly when the rains came so that where they had set in the hill they have made a large growth, but of inferior quality as compared with average crops, being watery and heavy; still they may be considered fair; we have hundreds of thousands of bushels to export.

Marion county, Iowa.—Potatoes were nearly destroyed, or apparently so, by bugs; some peculiarities of the species are long in shape, very lively, in color from ash to slate, and their numbers "were legion," enough to defoliate a potato patch in three hours after reaching it; subsequently, however, the plant revived, and the result is better than was at first anticipated.

Marion county, Mo.—Potatoes turn out far better than reported yield, and quality good.

SORGHUM.

Salt Lake City, Utah.—Our sorghum is greatly inferior to that of previous years; the cane has little juice compared with other seasons, the stalks are filled with an almost sapless pith, and what juice is pressed out is devoid of sugar to a great extent; it takes from 8 to 20 gallons of juice to make one gallon of sirup. One enterprising, good-managing farmer got only 30 gallons from ground which yielded 100 gallons last season, though his land was properly attended to.

Clark county, Ark.—I planted the cane seed sent in the spring on good upland, and made 104 gallons of sirup from the quart of seed planted on three-quarters of an acre; the largest cane measured 19½ feet in height and 8¼ inches in circumference.

Lewis county, Mo.—The crop of sorghum was good, but was neglected in order to save the corn fodder.

Graves county, Ky.—The sorghum crop is 20 per cent. above that of 1867.

McCracken county, Ky.—Our sorghum crop was very fine, but a frost came before much of it was cut, which affected it a good deal; the molasses seems to be very good.

Sangamon county, Ill.—Sorghum makers say it takes double the usual quantity of juice to make a barrel of molasses this year.

TOBACCO.

Baltimore county, Md.—The tobacco culture is getting smaller every year, being discontinued altogether in many localities; corn culture is taking the place.

Bedford county, Va.—Drought retarded the growth of tobacco, but when rain came ripening was delayed until frost destroyed a great many entire crops, and injured all more or less.

Randolph county, W. V.—The tobacco crop is indifferent.

Groves county, Ky.—Tobacco very fine, not eaten much by worms, housed in good order, very little damaged by frost; some little cut too green.

Pendleton county, Ky.—The crop of tobacco is unusually large and fine in this county.

Osage county, Mo.—The fall rains kept tobacco from ripening, and on the 7th of October we had a frost that destroyed two-thirds of the entire crop.

McCracken county, Ky.—The tobacco crop has probably never been excelled in this county; most of it was well matured before cutting; we have had very few worms, so that our tobacco is very nearly whole, which greatly improves the quality of the crop. The season has been rather wet to cure tobacco of a very fine color, but our crop is mostly a very nice red; some, however, is fine piebald, hickory leaf, &c.

THE LUNG PLAGUE OF CATTLE.

NEW YORK, *December* 31, 1868.

SIR: I have the honor of transmitting to you a brief preliminary report on the contagious lung diseases of cattle, in accordance with your instructions of the 7th of November.

It has been my aim to devote less space to details of visits and cases examined than to the general history and the best means of preventing the disease. The motive which has actuated me in this has been your desire to condense in a short memoir the facts and suggestions best calculated to insure the adoption of rational means for the complete extinction, on American soil, of a disease that is entirely of foreign importation.

I have the honor to be, sir, your obedient servant,

JOHN GAMGEE.

Hon. HORACE CAPRON,
Commissioner of Agriculture, Washington, D. C,

I. NAMES BY WHICH THE DISEASE IS KNOWN.

The earlier outbreaks in the British Isles of a very fatal form of inflamation of the organs of respiration were described under the title, "New Disease." Reports from Germany soon indicated that the malady was the "Lungenseuche" of the Germans, the "Péripneumonie contagieuse des bêtes bovines" of the French, the "Polmonea dei bovini" of the Italians. It was, therefore, soon identified in England under the names of the "lung disease," "pleuro-pneumonia," and "contagious pleuro-pneumonia of cattle." It was truly a new disease in England, and the readers of our great and pains-taking veterinary compiler Youatt can be assured that had the malady existed in England at the time he wrote, 35 years since, it would have received very different notice at his hands than reference, under the head "chronic pleurisy," as a "species" of this disease, "or of mingled pneumonia and pleurisy." All he knew on the subject he translated from a French journal*, in which Professor Lecoq described the affection as it occurred at Soire-le-Chateau, in Avesnes, France.

* Recueil de Médecine Vétérinaire, 1833.

II. WHAT IS THE DISEASE?

An Epizootic.—The lung plague is a fever attacking cattle, of a purely contagious character, spreading from farm to farm and country to country as an epizootic, and exclusively in the lines of communication established by the cattle trade. It never originates spontaneously. All domestic cattle, whether high or low bred, are alike subject to its ravages, without distinction even as to sex, age, or condition. Milch cattle have been destroyed in by far the largest numbers, inasmuch as the facilities for communication to this class of cattle have been greatest. The lung plague is, in my opinion, a disease of the greatest antiquity, and during the past century numerous reports from all parts of Europe, and wherever it has been transported, indicate that in all climes and at all seasons it presents well defined and immutable characteristics as to its insidious origin and propagation, symptoms, fatality, and incurability.

The poison, or virus.—The poison of the lung plague is deposited in varying amounts, but usually to the extent of many pounds weight, and not unfrequently as high as half a hundred weight, in the lung tissues, cavities of the chest, and air passages. The same poison may be reproduced in any part of an ox's system as the result of inoculation, and its development is usually co-extensive with the mass of areolar or connective tissue—the tissue that binds the skin to the tissues beneath and all the tissues to each other—into which it is introduced on the point of a needle, or by injection. The deposit is limited in parts sparsely supplied with this connective tissue, or where the parts are firmly enveloped by skin, as towards the end of the tail or tip of the ears. But occasionally even the greatest care in introducing a small quantity of virus on the surface of the skin without penetrating the more open textures below, results in extensive swellings due to a deposit which is identical with that occurring in ordinary cases of this lung complaint.

Tests for the poison.—Attempts have been made to discover microscopical or chemical tests for the poison. The only test is the physiological one, viz: the development of the same poison capable of indefinite propagation among cattle. It is only recognizable in the diseased animal, and every ox, bull, cow, or calf showing signs of such contaminations should be dealt with as a bottle of poison, a carrier of pestilence, breathing forth, even when its pulse is quiet, nutrition unimpaired, and convalescent, quite enough of the same poison to kill hundreds and thousands of its kind.

Infection.—The malady has been recognized as infectious, that is to say, the poison is diffused through the air by the breath of sick cattle. The poison is not gaseous or volatile. The solid elements in its composition like the solid germs of decay, or the delicate seeds of plants are carried by atmospheric currents. Myriads impinge on inert matter, but any passing into the air passages with the air breathed by cattle produce a local change, which is at first slow and unobserved, usually followed by a general fever, and in any case attended by the expulsion of abundant volumes of a similar material.

Inoculated disease not infectious.—Some years' experience and a large number of observations in various parts of Europe would indicate that when the virus is developed in or beneath the skin it remains in the system of the inoculated animal, the lungs are not affected, and there is no communication of the disorder except by inoculation. It may safely be accepted that the inoculated disease is, as a rule, not infectious.

The virus of lung plague, when transmitted through the atmosphere, can alone be preserved and transported in the breathing organs of susceptible cattle, which reproduce it. It is not carried, so far as we know, by other animals.

Incubation of the poison.—It may lie latent for a considerable time. Usually the period required for inducing obvious symptoms of sickness extends over 30

to 40 days, but during this time it is producing local effects, as proved by the results of inoculation, which are obvious nine days after the operation.

Latent effects.—It has been supposed that an animal may be infected and remain in health for several months. This is an error. The virus sometimes induces local changes without outward manifestations such as usually arrest attention. Its development under some circumstances is slow, and the affected animal or animals beginning later than usual to discharge poison into the air retain the faculty of communicating the disease until an almost complete recovery. The lung plague has therefore a latent stage in all cases, and in some it assumes what pathologists term a latent type, whereby its earliest attacks pass unnoticed.

Preservation of the virus.—The most certain means of preserving the virus for artificial propagation is by maintaining, as one gentleman has especially done near Glasgow, sick cattle, infected in succession.

By transmission.—An animal that has once had the disease is incapable of reproducing the poison, and although there are a few isolated cases of tardy relapse which would seem to indicate that a second attack of the malady may occur in an animal, it is almost universally admitted that, as in the case of other true epizootics, the lung plague attacks an ox but once in its lifetime.

In bottles.—The owners of cattle, and especially dairymen, have adopted the plan of preserving the virus for periodical inoculations in common bottles provided with a cork. The matter thus kept decomposes, but retains for many months the power of producing the usual and, generally, aggravated results after inoculation. This is a fact well worthy of careful inquiry and most suggestive to the many now engaged in tracing the history of animal poisons.

With glycerine—It was proposed, first in Australia, to mix the lymph from the lungs with glycerine. After many trials I had to abandon this plan, inasmuch as the glycerine impaired and ultimately destroyed the virus.

Desiccation.—The lymph obtained by draining the diseased lung may be placed between strips of glass and drying; as vaccine lymph does under similar circumstances, it retains its power for many months.

Destruction of the virus.—Preparations of chlorine, iodine, bromine, sulphurous acid, carbolic acid, sulphate of iron, &c., destroy the virus and render it inert.

III. WHAT CIRCUMSTANCES FAVOR THE TRANSMISSION AND REPRODUCTION OF THE LUNG PLAGUE POISON.

Contact of sick and healthy.—Approach of sick and healthy susceptible cattle is the fundamental and essential cause of contagious pleuro-pneumonia.

Cohabitation not necessary, but the most common cause.—Transmission of the disease does not require cohabitation. The most common means whereby the virus spreads is undoubtedly by sick or convalescent cattle being admitted into sheds, yards, or pastures, and retained in close proximity with other animals; but a variable degree of susceptibility is noticed from the animals first seized being often at the most remote part of a stable into which a sick beast has been introduced. There is some uncertainty in observations of this kind, from the fact, already stated, that some cases are latent and symptoms being very imperfectly observed by farmers and the usual attendants on stock.

Exposures in the open air, communication on railroads.—The communication of the disease in many European cities is due to the exposure of sick cattle for sale in public markets; the driving of sick cattle on roads; the transportation of diseased animals in railway cars in which, or in cars adjoining which, are healthy cattle. The ready propagation of the virus under these circumstances is generally admitted, and an inquiry into many outbreaks shows that when the disease enters among cattle in the fields it is often more rapidly fatal, less frequently latent, and better calculated to alarm stock owners than the more insidious

ravages by the disease in confined sheds. This is singular and not commonly known.

Malady aggravated by turning cattle out.—It has been observed that a stock of cows, among which the disease had been lingering, may be rapidly thinned by deaths from the disease if turned out to grass in spring. Deaths have been more frequent and rapid when cows have been turned out for some hours daily and housed at night than when they have not been moved from their sheds.

By free ventilation.—The disease having been introduced among stall-fed cattle kept in warm, and even ill-ventilated stables, the symptoms have been aggravated and deaths occurred much more rapidly after ventilating apertures have been made facing the heads of the cattle, and especially if such openings were made to the north and produced cold draughts through the stable. These facts have constantly led to the confounding of contagious pleuro-pneumonia with colds and ordinary inflammations of the lungs.

The disease transmitted by offal.—The only circumstances under which I have known the lung disease to be communicated when there has been no immediate contact between living sick and healthy cattle has been on fields adjoining slaughter-houses, when cattle suffering from pleuro-pneumonia have been slaughtered. It is evident, however, that even in this case the sick cattle have breathed in the vicinity.

How far the virus may be carried in the air.—We do not know how far the virus will be carried in the atmosphere. Usually the distance is very short. If a cow driven along a road communicates the disease, she does it by cattle approaching and drawing her breath as they rub their noses against each other.

Influence of the introduction of steam in spreading the lung plague.—The history of the lung plague, which is dealt with in another section of this report, indicates that the introduction of steam has been a most active cause favoring the transmission of the malady. The wants of large cities, and the advance made towards annihilating distance as one of the impediments to the cattle traffic, have led to the dissemination of the disorder.

Cities "fixed stations" of the disease.—In large towns, where cows are kept for dairy purposes, it is necessary that frequent purchases be made. This tends to render cities "fixed stations" for the reproduction of the lung plague poison, and of these stations the most important and the oldest in America is that of Long island, in and around Brooklyn.

Cattle feeding districts liable.—In Europe, those portions of countries where cattle are fed for the butcher and not bred—for instance, Fife in Scotland, Norfolk in England, and Meath in Ireland—are, next to the large cities, ravaged by the disorder.

Breeding and exporting districts usually exempt.—The breeding and exporting districts, like Texas and the western States of America, escape, except where blood-stock is introduced from infected countries to improve the breeds.

The long period of incubation and the frequently latent cases of the disease explain its propagation from England or Holland to the United States, the Cape of Good Hope, and the Australian colonies.

IV. SYMPTOMS OF THE LUNG PLAGUE.

Premonitory symptoms in herds.—When pleuro-pneumonia is introduced in a dairy or on a farm it is not unusual to have newly-bought animals sickening and dying. At other times an ox or cow recently bought thrives, and an expert auscultator is required to indicate that the animal is but recovering from the disease.

Incubation of the disease.—Not uncommonly a herd thus contaminated remains healthy for six weeks or two months from the date of the last purchase. Often no indication of sickness is recognized by the farmer for as long as three

and four months. A general unthrifty look of the cattle, and a frequent cough, especially if the animals are turned out of a warm stable daily into the cool air, may be observed. Soon one animal and then another from different parts of the same stable droop and show signs of sickness.

In Europe town dairymen have noticed that their first cases usually occurred in fresh cows, often transmitted to markets from healthy districts, but which have been confined in railway trucks or in markets in contact with sick cattle. These animals, bought at the time of calving, remain healthy until they come in season, and immediately after taking the bull show signs of the disease. It has been thought by town dairymen that they might prevent the disease if they could only prevent the cow going to the bull; and the idea of spaying has been entertained, though never adopted to any great extent. The experience of town dairymen affords a conclusive proof of the apparent length of the latent or incubative stage of the disease, and that experience is supported by numerous other observations and experiments.

I should be disposed to believe that the first changes in the lungs occur as rapidly after ordinary infection as after inoculation, and experiments on this point are well worthy of being instituted. The period of incubation in inoculated cases may be as short as seven days. It is often nine, and there are cases, of which a considerable number have come under my observation, in which the local eruptions and swelling have not manifested themselves under twenty or thirty days.

Invasion.—The earliest changes in the lung tissue occur slowly and without producing marked general disturbances. In examining infected herds it is usual to find animals in apparent health, which on auscultation reveal the abnormal sounds caused by the rush of air through inflamed bronchial tubes. So latent is this condition that I have known expert butchers purchase cattle that I have ordered to be isolated. They have paid full prices, doubting my opinion; and on keeping the animals that they might improve in condition on extra keep, the outward symptoms of the disease have appeared in from one to three weeks from the date I had condemned them. At this stage there is usually a slight elevation of temperature, amounting to one or two degrees.

Obvious premonitory signs.—The obvious premonitory signs are shivering fits, as in ordinary fever, but their transient and mild character lead to their often being passed unnoticed. The animal's coat looks dull, staring, and the skin is often rigid. An occasional cough of a dry and harsh character is noticed, and, when inspecting a herd in a field, if the cattle are made to move briskly several will be found to cough. For some days the cattle appear to thrive well, and milch cows yield a copious amount of milk. It has been remarked that they appear full—indeed fuller in the early morning than other animals which, like them, had not fed since the previous evening. The excrement is dry and urine somewhat scanty.

An expert dairymaid in the habit of milking cows where the disease prevails is apt to notice, as the malady declares itself, that there is some stiffness, and the milk is not so freely drawn as usual. The quantity of this secretion then diminishes.

The progress of the malady is then characterized by loss of appetite, altered gait, segregation of the sick from the healthy in the field, the sick standing with their elbows turned outward, their feet drawn forward, neck and head extended, and nostrils somewhat convulsively expanded at each inspiration. There is quickness of breathing, especially if the animal is even slightly disturbed, and on the slightest movement there is an audible grunt. The expression of countenance indicates uneasiness or absolute pain, and the eyes are prominent and fixed. The pulse rises to 70, 80, and even 100 beats per minute. In hot cow sheds the pulse is more frequent than in the open field in healthy cattle, and a corresponding increase is seen in this disease under simi-

lar circumstances. The respirations rise to 35 and 40 per minute, are labored, audible, and each expiration is often associated with a short characteristic grunt. This grunt is especially marked if the sides of the chest or the spine are pressed, and many years ago Leroy showed that graziers regarded this as a decisive symptom of the malady. A somewhat watery discharge from the nose, increased in the act of coughing, is noticed early in the disease, and driving sick cattle in the earliest stage produces much thirst, and there is a ropy saliva discharged from the mouth. The muzzle is hot and dry.

Cattle suffering from this disease as it advances are readily identified by persons having seen a few cases. They stand motionless, with protruding head, arched back, extended fore limbs, with elbows turned as far out as they can be held, and the hind limbs drawn under them, with knuckling at the near hind or both hind fet locks. When lying, especially in the latter stages of the disease, they rest on their brisket or lie on the affected side, leaving the ribs on the healthy side of the chest as much freedom of motion as possible.

As the disease advances the pulse gets more frequent and feeble, and the heart's beats, which are at first subdued, become marked and palpitating, as in cases of poverty or anæmia. The membranes of the eyes, mouth, and uvula are usually pallid, though the membrane of the nose is often red. The tongue is foul, covered with fur, and the exhaled breath has a nauseous and even fetid odor.

Listlessness, grunting, grinding of teeth, diminished secretions, weakness and emaciation, increase with the progress of the malady. The animals getting weak, lie more. They sometimes show symptoms of jaundice, have a tendency to hove or tympanitis from gases accumulating in the paunch, and their gait is so staggering that they appear to suffer from partial paralysis of the hind quarters. As all these aggravated symptoms declare themselves the pulse gets weak and often rises to 120 per minute; the breathing gets more frequent and labored; the animal gasps for breath. The spasmodic action of the nostrils is very marked, the grunt very audible, and there is a peculiar puckering of the angles of the mouth. The temperature, which is elevated during the acute stage of the disease, is irregularly up and down, according to the complications of the disease, and there is great tendency to coldness of the horns and extremities. Abortion is not an uncommon accident. The constipation which is a very common symptom of the lung disease is apt to be followed by diarrhœa in the later stages, and this is also associated with a considerable discharge of clear-colored urine.

Auscultation and percussion are valuable aids in the diagnosis of lung plague. Most persons can with a little care distinguish the sick from healthy cattle by listening to the sides of the chest. It does not require a skilful expert to recognize that the ribs are motionless and flattened over the consolidated lung, that there is an absence of resonance on striking the ribs over the affected region, and that the ear distinguishes a very distinct respiratory murmur wherever the lung is pervious, and an absence of this sound where the lung is transformed into a solid mass.

At an early stage of pleuro-pneumonia there is a harsh sound, roar, or rhonchus produced by the passage of air through the windpipe and its subdivisions. This varies in intensity in different cases, as some animals have more exudation on the mucous surface of the air passage than others, and the leathery-looking shreds of lymph adhering to the inflamed membrane vibrate as the air rushes past them and give rise to the harsh sound which may sometimes be heard by persons standing by a sick animal. In many cases one lung alone is affected and then the respiratory murmur is more distinct than in health, wherever the lung tissue is pervious, whereas there is a total absence of sound over the consolidated organ. Occasionally an air passage remains open through a mass of hardened lung, and the air rushing through this rigid bronchial tube makes a very decided whistling noise.

In the earliest stages of pleuro-pneumonia the deposit of lymph on the serous covering of the ribs and lungs produces a leathery friction sound, and as liquid accumulates in one or both cavities of the chest the respiratory murmur is lost towards the lower part of the affected side or sides, and it is alone distinct over the upper portions of pervious lung tissue.

A careful examination of the chest reveals day by day the progress of the disease. When one lung is affected an animal is much more likely to recover than when both are diseased. Portions of the diseased lung tissue are apt to die, and becoming detached or softened, producing cavities on the lungs, which are indicated by a cavernous râle or sound somewhat similar to that produced by blowing air in the hollow of the hands when closed against each other.

By careful auscultation the cases that tend to convalescence may be distinguished by less marked roughness in the inspirations, and a gradual though slow return of the respiratory murmur, with increased mobility of the ribs and easier movement of the flanks.

Termination.—Cases of lung diseases in cattle end in partial or complete restoration to health or death by prostration, suffocation, purulent fever, or hectic.

As a rule, when a herd of cattle has suffered from the contagious pleuro-pneumonia, the surviving animals whenever slaughtered show old adhesions, partial collapse of the lung tissue, atrophy or wasting of the lung, thickness of the heart's covering or pericardium, and sometimes chronic abscess. Complete recovery without leaving the slightest traces of pre-existing lesion occurs. It has been noticed that cattle that have once had pleuro-pneumonia fatten more readily than others.

Death supervenes during the acute attacks of the disease from shock, prostration, or gradual suffocation. When animals linger on for some time in the bloodless state peculiar to this disease, and which is mainly due to the great drain on the system by the immense discharge which occurs in the substance of the lung and cavities of the chest, a permanent impairment of the functions of nutrition or assimilation occurs, and although the appetite may be partially restored, emaciation advances, and the animal sinks. A terrible diarrhœa or dysentery usually accompanies this form of disease.

In other cases abscesses form in and around the lungs and in other parts of the body, and the animals die of purulent infection. Occasionally a cavity formed by the breaking up of diseased lung tissue communicates with the pleural sac or cavity of the chest, and a condition known to pathologists as empyema results to the certain destruction of the animal.

Duration of the disease.—Affected animals usually pass through an incubative stage varying from 20 to 80 days, and usually averaging from 25 to 40 days. The acute stage of the disorder varies from 7 to 21 days. Convalescence extends over a period of one, two, and even three months, during the greater part of which the convalescent animal is often capable of infecting healthy cattle.

The mortality varies from 1 to 90 per cent. of the affected animals. When a first case is isolated early all the remaining animals may continue to enjoy health. As a rule in mild outbreaks the mortality obtains 25 per cent., and in severe cases 60, 70, 80, and even 100 per cent.

In England the lung disease has doubled the usual cattle mortality of the country, and during many years 50 per cent. of the cattle that have died of disease have died of the contagious lung disease.

Latent form.—It is necessary that I should draw special attention to the large number of cases which run an insidious course and pass unobserved. These are the most dangerous, as less care is paid to their isolation.

Relapsing form.—An animal affected with contagious pleuro-pneumonia may to all appearances recover, the affected lung becomes limited by a capsule of solid lymph, and convalescence may apparently advance for some days, or even

weeks. Suddenly, however, a fresh deposit occurs, either in extension of the original seat of the disease or in another part of the lungs, and under these circumstances a fatal termination is the usual result.

V. APPEARANCES AFTER DEATH.

Animals that are slaughtered or are permitted to die in advanced stages of the lung plague present the following characteristics:

The internal changes are confined almost entirely to the chest. On opening this, by splitting the brisket, as the animal lies on its back, layers of yellowish, friable, false membrane, of varying tenacity, stretch across around the sac (pericardium) containing the heart. These adhesions exist on one or both sides of the chest, and are sometimes altogether absent. They are found bathed in a yellowish, grumous fluid or serum, highly charged with albumen and shreds of solid deposit. Portions of one or both lungs are found more or less firmly adhering to the membrane (pleura) covering the ribs and diaphragm, and in passing the hands, especially round the large posterior lobes of either lung, it is difficult, in advanced stages of the disorder, to detach the diseased portions of the organ from the ribs.

The false membranes, disposed in layers which may be stripped off the pulmonary surface, are found adhering more or less closely to it, and the membrane (pleura) covering the lung, which is usually smooth and glistening, is rough, of a mottled color, and with more or less marked papillary or warty-looking eminences. These are the vascular offshoots of the membrane feeding the deposit around, and in time the process of growth and formation of vascular or blood-carrying tissue may lead to as solid a connection between the lung and the sides of the chest as between healthy tissues. Such complete development is only seen in very chronic cases or animals that have recovered from the disease.

The fluid around one or both lungs varies in amount from a few ounces to several gallons. At times it is tolerably clear when warm, and gelatinizes on cooling. At others it is difficult to separate it from the shreds of lymph and false membranes in the meshes of which it is held. Pus cells frequently abound in it, and it assumes in a few cases the character of pus. It is especially purulent when abscesses have formed in the gangrenous lung tissue, and an opening has led to communication between the lung tissue and the pleural sac. Under these circumstances the fœtor noticed on opening the chest is intolerable.

On removing the lungs, great variations in extent but uniformity in essential appearances of disease exist.

In recent and mild cases one lung is found affected. Its surface may be smooth from the absence of deposit around it. Parts of the organ are collapsed, as in health, and the usual normal pink color is noticed. The affected part is swollen, hard, and mottled. On cutting into this, the older diseased portions present a very peculiar marbled or tesselated character. The substance of the lobules is solid and of a dark red color, and the tissue between the lobules is of a yellowish red, more or less spotted with red points, but sometimes of almost pure yellowish white color.

The more recent deposits are distinguished mainly by a lighter red color of the thickened lobules, and there are gradations from this condition to that in which the lobules are but slightly infiltrated with semi-liquid serum, and air still passes more or less into their air vesicles.

As the disease advances the extent of solidified and darkened lung increases, and portions of the lung tissue lose more or less the marbled appearance, from the blood-staining of the interstitial deposit. The consolidation of structures advances so that the blood vessels are obstructed, the diseased lung loses all means of nourishment, and the older, darker, and more solid portions become detached, so that they remain as foreign bodies imbedded in cavities in the

diseased tissue. The admissions of air through the air passages into these cavities by dissolution of the lung tissue lead to the cavernous sounds which the ear can detect in the living animal, and the broken-up tissue decomposes and induces great fœtor of the breath.

One lung may have several points diseased; each lobe may be affected and little or no communication between the several parts implicated. The great tenacity of a yellowish white deposit around a marked marbled centre of disease has been said to indicate a certain tendency to limitation by the formation of a capsule, and several encapsulated centres may be found.

On taking a warm diseased lung, severing the still healthy portions, making incisions into the parts solidified, and suspending them so that they may drain, a large amount of yellowish serum of a translucent character, almost wholly free or more or less tinged with blood, is obtained to the extent of pounds in weight. The amount varies with weight of diseased lung drained. The quantity of this and solidified deposit in a diseased lung is so large that from a normal weight of four or five pounds, a lung attains to 10, 20, 40, and I have seen one as high as 54 pounds in weight.

Air passages.—The condition of the air passages varies from a condition of perfect freedom down to the diseased portions of lung, to a state in which the mucous membrane is coated with false membrane or solid exudations of lymph. By suitable means it is not difficult to isolate the solid white lymph clogging the terminal bronchial tubes and air vesicles in the consolidated tissues, but at a distance from these parts it is only in some cases that a kind of croupy complication exists. I have seen an animal gasping for breath, with its mouth open, nostrils widely expanded, eyes prominent, and visible mucous membranes of a bluish red color; on opening the air passages of this cow after death, they were found throughout their whole extent nearly filled with a deposit similar to that usually found on the surface of the diseased lung.

There is little necessity for prolonging this description of cadaveric manifestations. The heart's sac is sometimes thickened by deposits around it. Not unfrequently it contains an excess of serum. The heart itself is contracted and pale, containing a little dark blood. The organs of digestion at different stages manifest a state of dryness. The third stomach, which is so constantly packed with dry food in febrile diseases, is in the same condition in pleuro-pneumonia. I have known the mucous layers spotted with irregular or circular congestions or blood extravasations, and the membrane softening in these parts has become perforated. In advanced cases there is more or less diffuse redness, and even blood extravasations in the large intestine with fluid, fetid and sometimes slightly blood-stained excrement, such as is discharged during life.

The anæmia or bloodless condition of other tissues, the dark dry look of the meat dressed by the butcher, the yellow color of the fat in some cases, and the small quantity of fat left in animals that have succumbed under a chronic attack, are all general signs of greater or less value, when taken in conjunction with the changes occurring in the chest.

VI. HISTORY OF THE LUNG PLAGUE.

It is only necessary for the present purpose to refer briefly to the history of contagious pleuro-pneumonia in order to show where and how this disease has traveled in the Old World; its importation into America, and the alarming character of its present existence at remote parts of this continent.

History abroad.—The contagious pleuro-pneumonia of cattle is a disease doubtless of the greatest antiquity. All reliable records point to the simple truth that has to be told of many contagious disorders, that it has travelled from the east westwards. Older writers confound it with rinderpest, and a host of other maladies. It was only towards the end of the last century that the

universal prevalence of the lung plague, wherever cattle were being driven to provide the many armies then stirring, led to its distinct and satisfactory descriptions. Early in the present century it ravaged France, Belgium, Hanover, and Holland. England, isolated by the ocean, and the extreme north of Europe, alone remained free.

With peace came the development of new industries, and the most important in relation to the history of pleuro-pneumonia was the establishment in Germany, Belgium, and Holland of distilleries, starch and sugar manufactories, &c., the refuse of which it was found profitable to feed to stock. This led to great activity and important modifications in the cattle trade, all favorable to intercourse between different countries and the dissemination of contagious disease.

Holland had long imported fat and milch stock from the Rhine provinces and other countries to the east. The malady was for six years in Belgium before it entered Holland. In 1835 it was transmitted from Gelderland to Utrecht. It reached South Holland immediately afterwards, and prevailed especially near the great cattle markets of Rotterdam and Scheidam. It then appeared whenever and wherever infected cattle were introduced into South Holland, the island of Zeeland, Drenthe, Groningen, and Overyssel.

By this time—1840–'41 and 1842—circumstances favored an agitation for the repeal of restrictions on free trade in cattle with England. The barriers to contagious disease fixed by our forefathers after the appearance of rinderpest in England were at last removed by Sir Robert Peel, and this caused the cattle traffic to grow apace from Central Europe through Holland to England. The great cattle-feeding province of the Netherlands, Friesland, was alone infected with the lung disease when its people eagerly sought to supply British wants, and from that day to this has been constantly the seat of the malady.

Dutch stock first introduced the lung plague into the south of Ireland. It appeared in 1842, in London. In 1843 English cattle communicated the disease to Scotland, and ever since, with the exception of a period of cattle trade restrictions enforced for the prevention of the Russian murrain, has been the most widespread, as it has been, taking the entire period of its ravages into consideration, the most destructive of all maladies attacking British cattle.

From Holland the disease travelled to the Cape of Good Hope, and from England at various periods it was communicated to Sweden, Oldenburgh, the Australian colonies, and other parts of the world.

History of the Lung Plague in America.—The first notice of the lung plague in the United States dates back to 1843, when a German cow, imported direct from Europe, and taken from shipboard into a Brooklyn cattle shed, communicated the disease, which, it is said and believed, has prevailed more or less in Kings county, Long Island, ever since.

In 1847 Mr. Thomas Richardson, of New Jersey, imported some English stock. Signs of disease were noticed soon, and the whole of Mr. Richardson's stock, valued at $10,000, were slaughtered by him to prevent an extension of the plague.

In 1850 a fresh supply of the lung-plague poison reached Brooklyn from England in the system of an imported cow.

Mr. W. W. Chenery, of Belmont, Massachusetts, has related the history of the introduction of lung plague from Holland into Massachusetts in 1859. Four cows were purchased for him at Purmerend and Beemster, shipped at Rotterdam early in April on board the barque J. C. Humphreys, which arrived in America on the 23d of May, 1859. Two of the cows were driven to Belmont; the other two had to be transported on wagons, owing to their "extremely bad condition," one of them "not having been on her feet during the twenty days preceding her arrival." On the 31st of May, it being deemed impossible that this cow could recover, she was slaughtered, and on the 2d of June following the second cow died. The third cow sickened on the 20th of June, and died in 10

days. The fourth continued in a thriving condition. A Dutch cow, imported in 1852, was the next one observed ill, early in the month of August following, and she succumbed on the 20th. "Several other animals were taken sick in rapid succession, and then it was that the idea was first advanced that the disease was identical with that known in Europe as epizootic pleuro-pneumonia." Mr. Chenery then did all in his power to prevent the spread of disease from his farm. The last case at the Highland farm, Belmont, occurred on the 8th of January, 1860.

In June, 1859, Curtis Stoddard, of North Brookfield, bought three young cattle, one bull and two heifers, from Mr. Chenery. One calf showed signs of sickness on the way home. Leonard Stoddard, father of Curtis, thinking he could better treat this sick calf, took it to his own barn, where he had 48 head, exclusive of calves, and with which the calf mingled. One animal after another was attacked, till the 12th of April, when 13 head had died, and most of the remainder were sick. The disease continued to spread from farm to farm as rapidly as circumstances favored the admixture of stock. The period of incubation in well defined cases varied from 19 to 36 days, and averaged 26⅔ days.

The people of Massachusetts, a little slow at first, overcame the delays incident to legislation, established a commission for the purpose of exterminating the disease, and an appropriation of $10,000 was placed under the control of the commissioners on the 4th of April, 1860. The disease was gaining ground rapidly, and a bill to extirpate the disease passed its several stages and was approved on the same day. Commissioners were appointed; herds were examined by surgeons, and, if infected, slaughtered; the animals pronounced healthy at the time of inspection alone paid for; all the money appropriated was spent, and such was the feeling then in Massachusetts that private gentlemen made themselves responsible for a second amount of nearly $20,000. An extra session of the legislature met on the 13th of May. Fresh powers were sought and obtained, additional commissioners appointed, and the disease apparently exterminated. It reappeared in 1861, a new board of commissioners was appointed, and further successful efforts made to prevent the disease. On the 24th of December, 1863, Mr. Charles L. Flint, in a letter to Governor Andrew, asserted that pleuro-pneumonia still existed in 12 or 15 towns of the commonwealth of Massachusetts. Mr. E. T. Thayer, to whom the people of Massachusetts owe much for his skill and industry as the veterinary commissioner, and Mr. Charles P. Preston, wrote their final report to the Senate and House of Representatives of Massachusetts on the 30th of December, 1867. In that report, and tendering their resignations to the governor, they congratulate the people on the success which had been insured by efficient co-operation "in eradicating one of the worst forms of contagious disease which has been found among cattle."

From numerous inquiries there is not the slightest doubt in my mind that the lung disease continued, ever since its first introduction, to attack some of the numerous dairies on Long Island. One of the best informed dairymen in Brooklyn informed me that, three months after starting in business, 16 years ago, he lost 11 out of 12 cows he had purchased in Newark, New Jersey. He bought more and began to inoculate with excellent results. Other people were losing, and he established himself on Jamaica Pond to be clear of every one. When he stopped inoculating the disease reappeared. Mr. Benjamin Babbit, of Lafayette avenue, was the first to inoculate after the introduction of this practice in Europe, and many dairymen adopted it. The board of health opposed the practice, as many of the cows lost portions of the tail, and reports were made of blood and matter finding their way into the milk-pail. The disease has never ceased, and I have visited many dairies, in all of which at one time or another and in most of which during the present year, the disease has prevailed. In five dairies I examined, within 100 yards of each other, I found

one or two sick cows in each. The Hartford Insurance Company, which has recently suspended operations, lost heavily on the insurance of cows from the prevalence of this disease, and that company objected also to the practice of inoculation.

From Mr. Bedell's statement, there is no doubt of the existence of the contagious pleuro-pneumonia in New Jersey when he first bought his cattle. Mr. Robert Jennings, veterinary surgeon, had his attention drawn to the disease on its appearance in Camden and Gloucester counties, New Jersey, in the year 1859. In 1860 it crossed the Delaware river into Philadelphia, spreading very rapidly in all directions, particularly in the southern section of the country known as "The Neck"—many of the dairymen losing from one-third to one-half of their herds. The sale of sick cattle continued, as it always does, unless prevented by rigid laws. In 1861 the malady appeared in Delaware, and in Burlington county, New Jersey, and the disease could be distinctly traced to the Philadelphia market.

The records of outbreaks are by no means satisfactory, but a gentleman well known in Maryland, Mr. Martin Goldsborough, informs me that the malady has been very destructive on many farms of that State for the past three years. Individuals have lost their entire herds, in some cases numbering 24, 30, and as high as 47 head. Last year an effort was made to direct the attention of the legislature in Maryland with a view to the adoption of successful measures, but without effect. Mr. Goldsborough's statement is to the effect that the disease in Maryland is due to the purchase of cattle in the Philadelphia market.

There is no doubt of the great prevalence of the malady for some years in Philadelphia. I have seen it on two farms in Delaware county, and it has been on several others recently. Bucks county has suffered much for two years. A correspondent informs me that in March, 1867, a drove of cows was taken into that county, and one of them was observed sick. These animals were distributed among the farmers and soon the plague appeared in all directions. An effort was made then to secure the aid of the State legislature, without effect, and to this day the disease is in Bucks county. The last case I have to report is at Newtown, Bucks county, where the disease was introduced by cows bought in the Philadelphia market.

That the malady has attained such proportions as to demand constant attention, apart from the fact that but one case on the whole continent is a source of incalculable danger, is proved by a circular recently issued by gentlemen in Westchester, Pennsylvania, and which is of sufficient importance to be reproduced here:

PLEURO-PNEUMONIA.—The great increase in the disease known as pleuro-pneumonia among cattle within a few years past, its highly contagious character and the acknowledged inability of the most skilful veterinary surgeons to control or in the least mitigate its severity in certain stages of the disease, calls for immediate and earnest attention from the community. It is a well known fact that the cupidity of many induce them as soon as the disease develops itself on their premises to hurry off their stock (diseased as well as those not diseased) to the nearest drove yard, to be there sold for whatever they will bring; to be either sold as food or driven off to new sections and there to infect and poison other animals with which they may come in contact.

With the view of arresting this increasing and wide-spreading evil, the undersigned, a committee of the "Mutual Live Stock Insurance Company of Chester County," an institution established purely for mutual assistance and protection, respectfully invite your co-operation in procuring such action at the hands of our next legislature, by the passage of a law authorizing the appointment of a suitable number of qualified and conscientious inspectors throughout the State, whose duty it shall be to examine thoroughly all animals, especially those offered for sale, wherever they may be; and subjecting those offering such diseased animals to both fine and imprisonment, and to take such other measures as may be deemed necessary to effect the entire extirpation of the disease from our midst.

I can corroborate the statements made as to the sale of cattle that are infected. Not only has this occurred often where the disease has been most rife for years past, as on Long Island, but recently, in making inquiries in Delaware county,

Pennsylvania, I learned of three cows which had been sold "healthy" (?) out of an infected herd. Such a practice explains the progress of the disease even further south than Maryland.

I recently visited the dairies of Kendall's Green and Georgetown, near Washington, and found that last year the cattle had been nearly entirely exterminated by the disease—so much so that to the present day the poor people who keep one or two cows are afraid to buy and in constant fear lest the malady should return.

Three years since the lung plague appeared in Alexandria county, Virginia. It has been steadily on the increase ever since, and continues to the present day.

I have been informed that the malady has travelled as far west as Kentucky and Ohio, but of this I have not been enabled in the brief time since I commenced the inquiry to obtain satisfactory evidence. I have taken some pains to ascertain if the disease had reappeared in Massachusetts, and personal inquiries in various parts of the State show that it is quite free from the disease, thanks to the energy of its people and the enlightened action of its legislature.

The conclusions that are warranted by the facts I have gleaned are as follows:

First. That the lung plague in cattle exists in Long island, where it has prevailed for many years; that it is not uncommon in New Jersey; has at various times appeared in New York State; continues to be very prevalent in several counties, especially Delaware and Bucks counties, Pennsylvania; has injured the farmers of Maryland, the dairymen around Washington, and has penetrated into Virginia.

Second. That the disease travels wherever sick cattle have a chance of being introduced, and that the great cattle-rearing States of the west, which may not at present be entirely free from the disease, have been protected by the fact that they sell rather than buy and import horned stock.

Third. There are no proper restrictions on the sale of infected stock, and in another year or two, unless some definite and immediate action be taken, the disease is likely to find its way in so many parts of the country that its eradication will be almost a matter of impossibilty.

Of all the cattle diseases pleuro-pneumonia is in the long run the most destructive, because the most insidious and the least likely to rouse a people to united action for its effectual suppression. To ignore its presence is, however, to insure that the cattle mortality of America, like that of England, will be at least doubled in a few years' time. Rational means, energetic action, and earnest co-operation between the different States and the central government may, with a moderate expenditure now, save many millions annually in the not distant future.

VII. WHAT ARE THE RATIONAL MEANS THAT SHOULD BE ADOPTED?

First. Reliable and complete data should be obtained from all parts where the disease is known or supposed to exist.

Second. The several States directly interested should take action in accordance with the example set them by Massachusetts.

Third. If possible, Congress should pass such laws and institute such inquiries as may tend to the discovery and prevention of the disease wherever State authorities cannot or will not cope with it.

From the inquiries instituted by me in Long Island, New Jersey, Pennsylvania, Maryland, and Virginia, I am convinced that a great deal can be accomplished by diffusing information and stimulating farmers to pay attention to the subject. Unfortunately all will not act for the interest of their neighbors and their country, and it is therefore essential to exercise some coercion for the universal good.

In Massachusetts, as in England, there was at first some objection to the

slaughter of entire herds. In relation to the lung plague this slaughter is unnecessary if competent authorities are appointed to superintend the slaughter, or complete isolation of absolutely sick cattle and the inoculation of the remainder.

I was once opposed to the practice of inoculation, but the experience of several years, especially since the meeting of the first International Veterinary Congress, in 1863, has convinced me that the practice is most beneficial.

Space forbids my entering into many details on this occasion, but it may be accepted as proved that whereas it would be inadvisable to introduce a wholesale system of inoculation among healthy herds, it is wise, economical, and adequate to the prevention of the disease to introduce the practice in all stables and on all farms where the lung plague appears. It fails only when the cattle have all become simultaneously infected and no time is allowed for the inoculation to take effect.

The isolation of infected herds, whether inoculated or not, should last for at least two months after the last case of sickness.

The method of practicing inoculation is extremely simple. A portion of a diseased lung, if possible in the early stage of the disease, is taken warm and sliced so as to drain the lymph into a convenient vessel. A small syringe with a sharp-pointed steel tube is filled, and a drop or two of the lymph is injected into the skin of the tail, which is punctured about an inch from the end. The rude old plan of inserting a piece of lung into an incision at the top of the tail succeeds, but is more likely to prove ineffectual or dangerous than the simple and ready method I have described.

It may be desirable to collect the lymph and prepare it for distribution. This can be done, in my opinion, by evaporating the liquid from the lungs in shallow porcelain vessels at a low temperature and with the aid of the air-pump.

CEREALS FOR ANALYSIS.

The Department having resolved upon making a series of chemical analyses having for its object the determination of the chemical values of cereals (wheat, corn, oats, and rye) grown in this country under the varying conditions of latitude, altitude, and general climate, has issued to the various State societies of agriculture the subjoined circular, in the hope that a more extensive collection may be obtained in that way. Replies and samples are being received from some sections of the country, and the circular is here inserted in order to give it more publicity, so that the Department may obtain specimens of cereals of fair average from every State in the Union:

DEPARTMENT OF AGRICULTURE,
Washington, December 20, 1868.

SIR: In view of the great extent of our agricultural territory and its consequent variety of soil and climate, and of the fact that the United States has become one of the greatest grain producers for European and other markets, it appears necessary that an extended examination of the breadstuffs grown in the several regions of our country noted for producing corn and grain of prime quality should be made, in order to determine accurately the chemical composition and food value of American crops. The chemical examinations of food materials grown in the United States hitherto made have been of a few samples and from a limited area of growth.

It is now desirable to ascertain what differences climate, elevation, latitude, and meteorological conditions have in determining the food value of certain cereals, and the relative variations of nutritious principles contained, as produced

by such modifying influences. The information thus obtained must have a most beneficial effect upon our future cultivation.

To arrive at truthful results several hundred analyses should be made; and to further the object of the Department, and carry out this undertaking successfully, I have to solicit your assistance in obtaining and forwarding, during the coming autumn, samples of corn and grain grown in your State, (or county,) which you will please select and forward in accordance with the suggestions appended.

I am, respectfully,

HORACE CAPRON, *Commissioner.*

———— ————,

Sec. ———— *State Agricultural Society.*

SUGGESTIONS.

1. Corn and grain, (wheat, oats, rye,) the growth of this year.
2. Samples of average character only desired, except in cases where the prize specimens represent a large cultivation, when the latter are preferred.
3. Not over two pounds weight of each sample will be needed; which may be enclosed in cotton or linen bags, and well protected on the outside from moisture. Such samples will come free of postage if addressed to "Department of Agriculture, Washington, D. C."
4. Any particulars in reference to growth, as location of land, physical peculiarities, quality and quantity of manures, sowing and harvesting.

POTATOES—YIELD OF VARIETIES.

The following table exhibits the yield of the several varieties of potatoes named, grown upon the grounds of the Department the past season:

Varieties.	No. of pounds planted.	Yield in pounds.	Percentage in pounds.
Blue kidney	21	187	9 pounds for 1 pound, $3\frac{1}{3}$ bushels.
Scotch blue	23	637	$27\frac{1}{3}$ pounds for 1 pound, 11 bushels $1\frac{1}{2}$ pecks.
Rock	24	776	$32\frac{1}{3}$ pounds for 1 pound, $13\frac{3}{4}$ bushels.
Napoleon	23	539	$23\frac{1}{3}$ pounds for 1 pound, $9\frac{7}{11}$ bushels.
Early Goodrich	14	226	$16\frac{1}{7}$ pounds for 1 pound, 4 bushels 2 pounds.
Harrison	15	493	$32\frac{1}{3}\frac{3}{3}$ pounds for 1 pound, $8\frac{3}{4}$ bushels.
Regent	20	602	$30\frac{1}{10}$ pounds for 1 pound, $10\frac{3}{4}$ bushels.
Victoria	$22\frac{3}{4}$	365	$16\frac{1}{2}\frac{1}{3}$ pounds for 1 pound, $6\frac{1}{2}$ bushels.
Blue	13	327	$25\frac{2}{1}\frac{5}{3}$ pounds for 1 pound, $5\frac{7}{8}$ bushels.
Early red kidney	8	21	$2\frac{5}{8}$ pounds for 1 pound, $1\frac{1}{2}$ pecks.
Early	15	585	39 pounds for 1 pound, $10\frac{5}{11}$ bushels.
Albert	20	943	$47\frac{3}{2}\frac{3}{0}$ pounds for 1 pound, $18\frac{7}{11}$ bushels.
Economist	22	956	$43\frac{1}{2}\frac{0}{2}$ pounds for 1 pound, $18\frac{6}{7}$ bushels.
Red	22	494	$22\frac{1}{2}\frac{0}{2}$ pounds for 1 pound, $8\frac{9}{11}$ bushels.
Total amount	$262\frac{3}{4}$	7,151	Average, 27.23 pounds for 1 pound.

The Early Red Kidneys were affected with the rot when planted, and the yield was therefore very light.

CONDITION AND PROSPECTS OF SOUTHERN AGRICULTURE.

From the many interesting letters received in response to a circular sent out by this Department for the purpose of collecting information in reference to the condition and progress of southern agriculture, we select the following comprehensive paper from John A. Trenchard, esq., of Elberton, Georgia, for insertion in the monthly report:

1. For an average of 10 years, say from 1850 to 1860, there was about one-third of the acreage cultivated in what is called in this State clean crop, to wit: cotton, and corn planted in cotton; the balance, or the other two-thirds, was planted in corn. Add to the above 33⅓ per cent. for the land planted in small grain, (principally wheat and oats,) and you will have about the average percentage of the principal crops grown in this section of the State.

2. The mode of culture was the same as that now practiced, to wit: the land is first bedded up; this is done by laying off the rows with a small scooter plough about three feet apart; then a turning-plough is used to throw up the soil on each side of the row furrow, making a high bed of soil over the row furrow and leaving a deep water furrow in between the rows; the top of this bed is then opened with small scooter plough two to three inches deep; the cotton seed is then sown in this drill furrow at the rate of three to five bushels per acre; a small harrow, or, what is more usual, a piece of board about twelve inches long, fastened to the foot of a small wooden plough stock, is then run over this drill furrow, covering the seed from one to one and a half inch deep. In a period varying from five to ten days, owing to the temperature of the weather, the young plant makes its appearance; as soon as fairly up the working commences. Some chop through the rows with a hoe before ploughing; cutting out a portion of the young plants and stirring the earth about the roots of the remaining ones, so that the rays of the warm sun may penetrate and permeate among the roots, for cotton is a sun plant; the more sun the young plant gets the more rapidly it grows; but more usually the cotton row is sided with a very narrow scooter plough, so arranged as to throw the soil from the roots of the plant, for the same purpose as above stated in manipulations with the hoe, namely, that of giving the young plant the benefit of the sun. After this siding of the cotton, the hoe is run through it, thinning it partially to a stand, leaving enough in the rows to make a stand after the plants quit dying, which is not generally the case till the second working, after it is thinned down to a stand of two or three plants in a hill, six inches to one foot apart. After first siding and hoeing the cotton as before stated, the middle of the rows are ploughed out with a wide shovel or a sweep, which latter implement only cultivates the surface of the earth from one to one and a half inch deep. The crop is then ploughed and hoed alternately three or four times, keeping up the working till the middle or last of July. The surface culture for cotton is the most approved mode by our best and most scientific farmers.

3. The product of genuine cotton per acre varies according to the quality of the land cultivated. Unmanured lands produce from 50 to 400 pounds of ginned cotton per acre; the general average for this State is about 100 pounds per acre, and the average per hand is about 1,200 pounds ginned cotton, or three bales per hand. Some of our best planters have by the free use of fertilizers and by skilful modes of culture grown on one acre 1,200 pounds of ginned cotton. Mr. David Dickson, of Hancock county, Georgia, who has carried experimental farming to a higher degree than perhaps any other man in the State, has even exceeded the foregoing amount per acre on a small lot highly cultivated; but these are only exceptional cases; still they show what can be done by high fertilizing and improved and skilful modes of culture.

4. The profit per hand during the ten years preceding 1860 varied from $50 to $300, but since 1865 the farmers have generally sunk money by their farming operations; owing partly to the inefficiency of the recently freed labor, together with the long drought of 1866 and the excessive rains of 1867.

5. The price paid for the labor of men in 1860 was $125 per annum, with food and clothes furnished by employer; for that of women, $80; for that of youths, $50. The price sof same classes in 1867 were, for men, $100, with fuel, but no clothes furnished—that is, the laborer furnishing his own clothing; women, $60; youths, $30. For the present year, same classes, men, $60 to $70; women, $40 to $50; youths, $20 to $30. A large portion of the hands this year have contracted for a part of the crop. Some get one-half of the net profits after deducting all expenses, some one-third, gross products, the laborer feeding himself and the employer bearing all other expenses; others get one-fourth of the gross products, the employer feeding the laborer and paying all the expenses of the farm.

6. There has been no material change in the mode of culture since 1860. The size of plantations has been considerably diminished in the last two years. Planters find that they must only cultivate their best lands with freed labor; and that, too, at a decreased ratio of profits.

7. As before stated, Mr. David Dickson is the most scientific and also the most successful planter in this State; he uses No. 1 Peruvian guano, dissolved bones, salt and gypsum, 100 pounds of each per acre, manipulated or mixed together, which, according to his published statements, pays him one hundred per cent. on his investment. Mr. James Davison, of Greene county, Georgia, experimented quite extensively last year with stable manure, and several of the commercial fertilizers. The experiments with Peruvian guano increased the yield 140 per cent. when compared with the yield from same kind or quantity of land without fertilizers; some other of his fertilizers increased the yield to over 200 per cent.; this was done with common wood-ashes and salt.

8. The cost of the production of cotton in 1867 was about 15 cents per pound; and as most of our planters sold their crops for less than that figure, cotton-planting was a losing business last season.

9. But very few colored men have planted much cotton entirely free from the control of white men, so far as my knowledge extends; but the few instances show that they have succeeded about as well as the whites.

10. The principal circumstance that affects the comparative profits of large and small plantations is, the labor not being well trained under the new system, renders it necessary for the planter to give close personal attention to all the minutiæ of his planting operations; and this he cannot well do with more than 10 or 12 hands.

11. There is little or no improvement in the use of farming implements in this State.

12. There is no crop cultivated in this State that will pay as well as cotton.

13. There is not sufficient attention paid to the improvement of the breeds and raising of stock in our State. First, stock can be raised with very little expense; the winters being short, but little gathered food is needed to winter stock. In some sections of the State, stock winter well on the cane-brakes, and on the native grasses that flourish during the winter seasons without any gathered food at all. Second, by increasing the number of stock on a farm, you greatly augment your means of enriching your lands by manuring. Third, the beef and mutton from your flocks being an excellent substitute for bacon, should be another incentive for raising more and better stock.

14. Our State is gradually sinking lower and lower in poverty and general demoralization under the new state of things with which we find ourselves surrounded. A confusion almost equal to the confusion of tongues at the Tower of Babel compasses us about, and threatens to overwhelm us in general ruin,

and in all this sad state of things the laborer is not so much at fault as the employer. Almost the entire mode of culture must be changed under our new status. Before the downward career of our prosperity can be arrested, the white population must become inured to habits of industry; they must learn how to manage free labor by offering the rewards of good wages to the faithful laborer, and must get rid of the old idea that the whip is the only real incentive, and must learn to bring out free, voluntary and spontaneous labor by those nobler and sublimer incentives that will make it pleasing in the eyes of the laborer, and which a just Providence can bless; then, and not till then, will this once great Empire State of the south begin to emerge from her sinking condition; to develop her mighty resources, and again become not only the Empire State of the south, but the Empire State of the Union.

THE SCUPPERNONG GRAPE.

The following letter has been received from Louis Froelich:

Kenansville, N. C., November 1, 1868.—It gives me pleasure to send, in accordance with your request, my 10 years' experience in the culture of the Scuppernong grape. I will first give the several points, from one to six, and then present a general view of the subject.

1. The vines should be planted 45 feet apart, or 21 vines to the acre.

2. The vines should be planted in December or January.

3. We have the White and Black Scuppernong, and the Flower, the Mish, and the Bullace.

4. One hand is required for each 10 acres under cultivation, and in the gathering season one hand to the acre.

5. The yield this year has been equal, in quantity and quality, to the crops of the preceding 10 years. This variety is the only grape entirely free from disease, and the vines are not troubled by insects. They sprout very late in the spring, and are, therefore, never injured by frost, and their hardy wood, and the thick, leathery skin of the grape exempt them from injury from hail-storms, &c., rendering the Scuppernong the surest crop of grapes I have ever found or heard of in any wine-growing country. At my old home on the Rhine we had in each five years two entire failures, two seasons of inferior wine, and only one perfect crop; and I found nearly the same results in Austria, Hungary, France, and Italy, and in the northern or western part of the United States. Indeed, we have not in this country a single variety, except the Scuppernong, which is not liable to injury from frost, or in danger of not ripening through unfavorable seasons or the various grape diseases. With this variety, however, we may calculate with certainty each year, in both quantity and quality, and with the fifth part of the labor and expense attending the cultivation of other varieties, the average yield for a three year old vine is one peck; five years old, two bushels; full grown, ten year vine, 25 bushels.

6. Expenses per acre the first year are as follows: 21 plants, of good size and well rooted, $5; planting and staking, $10. Third year, 84 arbor posts, and 21 dozen fence rails, $15. Fifth year, 336 posts and 1,000 rails, $60. Tenth year, 500 posts and 1,500 rails, about $100. From the fifth year it takes one hand for cultivation and the extension of arbors, and from the first to fifth year about two years labor of one hand is requisite. After the tenth year it costs very little to manure the vines every two years, and gathering expenses and repairs of arbors may reach $10 per year. When 15 years old, and kept in the highest cultivation, the vine will yield 35 to 40 bushels of grapes. We have a good many single vines that bear 50 to 75 bushels. A full ripe bushel

of Scuppernong grapes weighs 60 pounds, and will yield 4 to 4½ gallons of juice, after which the pommace will make five gallons of vinegar. To the four gallons of juice add four pounds of crushed sugar, and at the end of six months you will have 3½ gallons of good marketable wine, worth on an average $2 50 per gallon. The five gallons of vinegar will yield at the end of three months 4½ gallons of first quality vinegar, worth 50 cents per gallon, thus realizing from one bushel of grapes $11; from one vine, in full bearing, $275; and from one acre of 21 vines, $5,775. The expenses attending the production of this wine foot up nearly $800, and for the vinegar $125, leaving a profit of about $4,850 on the product of the acre of vineyard.

The Scuppernong is the most profitable grape in the world, but is known only in the south, especially in the Carolinas, as the summer seasons of the north are not long enough for its successful cultivation. In the Carolinas it grows on the poorest sand hills, on the lowest swamp lands, and on stiff, clay, gravel land, the last named being the best for it. This grape has grown wild, without care or effort to improve it, but last year I gave this subject special attention, and found the vines highly susceptible to improved cultivation.

The vine must be planted well rooted. Dig a hole four feet square and two feet deep. Throw the first foot of earth on one side, and the second foot on the other side. Throw the first foot of earth back into the hole, then fill up to within six inches of the top with good compost, and then spread the roots of the vine out carefully, and fill the hole with the same compost, about three inches above the surface, trampling it level with the surface with the feet. Fasten the vine to a pole about three inches thick, and eight feet above ground, put in when the vine is planted. During the first and second years, when the vine is sprouting, all side limbs should be pinched off smooth, the main stem only being allowed to grow up. Keep the main stem well fastened and straight, and raise it about a foot higher than the pole, and then allow the sprouts to spread out in all directions on a 12 feet square arbor. I used last year, instead of slats or rails on the arbors, telegraph wire, spread over like a sifter, about two feet square, with surprising results. The vines grew twice as much as those of the same age on wooden arbors, and the grapes ripened more equally, and one-third more in quantity. The wire arbor costs little more and will stand 30 years when galvanized. The sun and air strikes better through the wire, and the vine will grow much faster than when on the slats or rails, the little ringlets which sprout out from the vines winding around a small thing more readily, and thus keep the vine steady and assist growth.

The third year the vines must be manured and every three years thereafter. For this purpose dig a ditch around the vine (so far as the little roots reach) one foot wide and one foot deep. Fill the ditch half full of compost and then fill up with top soil. The manuring should be done in December or January, as summer manuring makes the vine rusty, and causes the fruit to drop off before ripening. Raw stable manure should not be used, but should first be composted, mixed with any soil. The cheapest and best is swamp muck, and if you wish to make it as rich as guano, mix with it bone-dust, ashes, and lime, and about 10 per cent. of stiff soil.

Unlike all other grape vines the Scuppernong does not need to be pruned back. After the grapes are gathered take out all the dead limbs, and cut off all ringlets, for they are destructive enemies of the vine when wound around the limbs, preventing full growth, and sometimes killing the limbs. The outside end limbs, of last year's growth, should be straightened and spread out on the arbor in all directions and fastened. This is an important work, as without it the vine will grow wild and tangled, and the limbs be prevented from spreading, in consequence of which some of the fruit will never be reached by the sun or air, the sugar in the grape will not get a chance to concentrate, and the grapes will fall off before maturing.

Grapes should be gathered at three different times by the following plan: Make a wooden frame about ten feet square, placed on two axles with four small wheels; cover the frame with a strong cloth, made a little deeper in the middle; roll this frame under the vine you wish to shake; then shake the vine gently with a smooth iron hook fastened on the end of a stick, when only the perfectly ripe grapes will fall. The unripe grapes must be picked out for vinegar, and the leaves and trash should also be taken out. In this way two hands may pick 100 bushels a day. From the first gathering you will get about one-third of the crop. The second gathering comes 14 days later, and the third 14 days after the second.

The above treatment of the Scuppernong insures the following improved results on the old treatment: The first year we get three times as many grapes, which will, without the addition of sugar, produce a splendid wine, similar to Rhine wine. By adding one-half to one pound of sugar to the gallon we get heavy wines, similar to Malaga, Madeira, and Port.

Scuppernong rooted plants can be raised only by layers; cuttings do not take root, but bleed to death. The seeds of the White Scuppernong produce the Black Scuppernong. The white grape is a grade richer in sugar, and finer in flavor than the Black, Flower, and Mish grapes.

IS TEXAS A WINE LAND?

C. E. Bauer, of Fayette county, Texas, thus writes:

In what is properly called wine-growing Texas, and especially in this district, there has as yet been little done in vine culture. Only here and there have one or more species of grapes been planted, which, in the majority of cases, have returned a very poor result, and have soon disappeared either on account of the climate or in consequence of neglect. Of the transatlantic vines the greater part do not prosper here; some species will bear and ripen tolerably, but only for table use, as they are never reliable enough to be raised for the wine-press.

There is, however, a species here, forwarded to us by Mr. Brink from the garden of Dr. Moore, in Houston, which promises to become very profitable, and, according to my judgment, it is the Catawba, at least it resembles it strikingly. Messrs. C. Schuedemagen and Carl Vogelsang have vines of it in bearing, and I had during the present season the opportunity of seeing them in full fruit. They bear a luxuriant crop and yield good claret. During the present as well as the last season, however, they were somewhat affected by the dry rot, but this may have been in consequence of the wet seasons, which were unfavorable for vintagers, and moreover, in both cases, the vines were not sufficiently exposed to the air, which ought to be done in every vineyard. Also the roots may have been too flat and shallow, as in both instances the vines were raised from cuttings, which should be avoided in southern States, as it has been proved that in all vineyards planted with cuttings dry and wet rot and mildew have prevailed a great deal more than in those planted with roots. It is an ungrateful job to plant cuttings here. I have planted such for three consecutive years, and each time, on account of dry weather, have lost two-thirds of them. We have, therefore, to practice the layering of the plants so that we may more speedily and more surely raise plants with roots.

The best and surest way, however, to raise acclimated and richly bearing vines would be to improve our own indigenous Texas wild grapes, for even the European vines of the highest fame, as Chasselas, Muscat, Traminer, Malvasia, Reisling, &c., were not always what they are at present, and only by constant improvement have they been brought to the present climax of perfection. We have

three principal native species, (of which each one has several varieties,) viz: the Mustang, the Postoak, and the Winter grape.

The Mustang bears a cluster of middling size, with large berries, well shouldered, of thick skin and dark bluish color, covered with blue bloom and of sharp acid taste, and ripens at the end of July. Many prepare from this species wine for domestic use, but it is mostly quite inferior in quality.

The Postoak bears also clusters of middling size, well shouldered, with large berries of thick skin, but they are of dark brown hue and of spicy acid taste, and ripen near the end of July. Of this species I never yet have seen fermented wine.

The Winter grape with middling large, rather long bunches, without shoulders, has very small round berries of thin skin, transparently brown, covered with bluish bloom, of exceedingly pleasing and spicy taste, only a little too acid, ripens in October. When gallicised and the fermentation is properly guarded, it yields an excellent claret.

The latter two species are adapted for general cultivation, but neither scaffolding nor pole could follow the exuberent growth of the Mustang and render it the necessary support. The Postoak does not creep high and easily grows, even from cuttings. The Winter grape is the finest and noblest of all three, and bears also on low vines, but cuttings of it cannot be coaxed to grow even by the most tender care.

There are some other species of grape in Texas, as the Muscatine, which is mostly found near the shore, but it shows itself very sterile in its wild condition.

We need not be discouraged by the failure of some persons, as most of them do not understand anything of the culture of the American grape. I have never seen as yet a vine trimmed according to the splendidly successful renewal system, and no one as yet could give me thorough information as to the amelioration of vines by and through themselves, so whatever knowledge I possess I have had to acquire from books and correspondence. Let us unite and begin the work, for there is not a hill between the Sabine and the Rio Grande, nor a valley from the western mountains to the Gulf, where the luxuriant vines do not smile from the top of the mighty oak and with exuberant clusters of delicious fruit proclaim to us: Texas is a wine land!

INSECTS INJURIOUS TO THE GRAPE.

S. V. Rathvon, of Pennsylvania, furnishes the following paper upon a subject of increasing interest among grape-growers:

The grape vine is, unfortunately, subjected to the depredations of quite a number of insects of various species, but perhaps there are none more troublesome or more pernicious in their effect than the different species of "leaf hoppers" that infest it, and which are sometimes very improperly called *thrips*. Before we enter into a discussion of the habits of this *spurious* thrips, perhaps it would be well and useful to have a more correct understanding of the true one, in order that we may know precisely where we stand and what we are talking about in relation to their history and habits.

The true "thrips," of which there are several species in the United States, all belong to the single family *thripidæ*, and they constitute Mr. Haliday's order *thysanoptera*.* They are minute black insects, rarely exceeding a line in length, with four equal, long, narrow, membranous wings—neither folded nor reticulated—with long ciliæ, or fringes, all around both edges, and laid horizontally along the back, when at rest. There is very little difference, in the general form, between the *larva*, the *pupa*, and the *imago*. In the first state the wings are entirely absent, in the second they are present rudimentally, and in the third they are fully developed. The commonest species usually occurs most abundantly about the time of the wheat harvest, and hence it has been supposed that this insect (*Thrips cerealeum?*) is in some manner connected with the injury of the crop; but this, from recent observations and inves-

* Fringe-winged insects.

tigations made by competent and intelligent observers, is found to have been a mistake. The *thripidæ*, so far as their habits are known, are not vegetable feeders at all; but, on the contrary, they feed on the eggs and larva of the wheat midges, bark-lice, leaf-gall insects, flea-beetles, and various other species, and are, therefore, carniverous or cannibal in their habits.

There are, however, some of the most respectable European authorities who have generally described the various species of thrips as injurious to vegetation, but Mr. Walsh, of Rock Island, Illinois, assures us that they are all entirely mistaken. The mature insect is very small, and the larva is still less; and as it is in this latter state of an orange color, those English farmers, upon whose reports both Messrs. Kirby and Curtis seemed to rely in their descriptions of its habits, may easily have mistaken it for an enemy of the wheat, when, as Mr. Walsh positively asserts, it only visits the wheat heads to feed on the eggs and larva of the wheat-fly already there. If this be really so—and every closely observing wheat-grower may have an opportunity of testing it for himself—then our American entomologists have made a step in advance of those of Europe. But whether this is really so or not it has nothing to do in determining what a thrips really is, in contradistinction to that of another insect which passes by that name. European authors say that the males of these insects are *apterous*, and that only the females have wings; but as this differs widely from the usual order that obtains in other allied species, they are probably also mistaken in this. My object being merely, in this introductory part of the subject, to convey to the mind of the reader an intelligent idea of what a thrips is in its *form*, in order that it may not be confounded in *name* with an insect of a different order, form, and habits, I do not deem it necessary to make any suggestions in regard to a remedy for that from which fruit-growers have not, as yet, suffered any injury. I will just remark, in conclusion, that I have seen the common species in millions during harvest time, and that when they light on the exposed parts of the body they cause an unpleasant sensation, perhaps by their bite.

Having said this much in reference to the true thrips, whose real character may not be truly known in this country, I pass on to consider the "vine-leaf hoppers," and others, which infest the grape leaves in various ways, and to which have been applied, mistakenly, the name of *thrips;* a practice which only tends to involve the whole question with mystery and untold difficulties; because, when inquiries are propounded to the entomologist, without accompanying them with specimens of the insects complained of, he is altogether in doubt what answer to make, in consequence of this confusion of names. The *vine-leaf hoppers*, or at least a number of them, belong to a family of small *homopterous* insects, called "tettigonians," (*Tettigoniidæ*,) and are of several genera, the most common of which is *Erythroneura*. The most common species of this genus is *E. vitis*, and is probably the one that is generally alluded to when grape-growers make their complaints about the "thrips," in various parts of our country. These insects, of which there are some eight or nine species, are all of the same shape, and pretty much all of the same size, but differing from each other in color and general markings; and even the same species differs very much in its various stages of development; the young also differing from the adult in being without wings. Dividing one inch into 100 parts, these insects, when matured, will measure from 12 to 15 of those parts, in length. Their bodies are broad in front, and taper backward to the end of the abdomen into a cone shape, or like a miniature Minié rifle slug. The head is broad, and the antennæ are short and bristle-shaped. The upper wings extend beyond the body, and are deflexed, closing over it roof-shaped. The anterior and medial feet are small, but the posterior pair are long and armed with small spines along the outer margin of the *tibia*, something akin to the common grasshoppers, which gives them immense leaping powers; a power which they never fail to exercise when an attempt is made to capture them, or when they are disturbed. The adult species, however, do not depend wholly upon leaping, but have also the power of an extended flight. If their interruptions are not of too violent a character, they will elude their enemies by merely dodging around to the under side of the leaf, instead of leaping or flying. Their colors are different shades of yellow, green, pink, white, and brown, according to species and stages of development, diversified by bands and markings of various kinds. They usually attack grape leaves in swarms, near the end of July, and during the months of August and September; and, as every grape-grower well knows, they are exceedingly injurious, destroying the vitality of the leaves, causing them to become crisp and shrivelled, and to fall prematurely. These insects, however, do not gnaw holes into the grape leaves and feed upon their entire substance, as some others do; but, on the contrary, they pierce them with their small sharp *haustellum*, or sucker, and drain them of the sap that is necessary to their health and thrift. The eggs are deposited on the under side of the grape leaves in the month of June, in clusters, and when the young come forth, they for a time remain in the same place, with their suckers inserted in the leaf, and are actively engaged in sucking the sap. From that period until the 1st of August they moult several times, and their white, cast-off skins may often be found in numbers upon the leaves. As they grow older they become less gregarious, and leap from one leaf to another with increased activity.

It would be impossible for me, in a limited paper as this must necessarily be, to enter into a specific description of all the insects that in various ways attack the grape vines, and therefore I can only allude to them in general terms, and even then, I am compelled to omit many that may have come under the observation of grape-growers in different localities,

from the fact that the history of many of them is still unknown, and those species that may abound in one particular locality may be wholly unknown in another. The next most common species of these insects belongs to the genus *Otiocerus*, of which, perhaps, the *O. coquebertii* is the most common example. These insects belong also to the family *Tettigoniidæ*, and are nearly of the same size as those of the former genus I mentioned, but more slender in their forms. But as they are more common to the wild grape than the cultivated varieties, it will be unnecessary to do anything more than to make this passing allusion to them, and also to say that there are some 9 or 10 species of them, comprised under the genera *Otiocerus*, *Anotia*, *Brachymorpha*, and *Naso*, and that some of them are of a shining black color, and have the anterior portion of the head extended into a cone shape; with very short wing covers. In addition to these "vine-leaf hoppers," there are several species of *Thelia*, commonly called "tree hoppers," which are much larger in size than the former, but which do not occur in such formidable numbers. These belong to the family *Membracidæ*, and in shape approach the form of a beech nut; often with a perpendicular protuberance arising from the thorax of the males; being of a chestnut brown in color, and about one-third of an inch in length, and one-fourth of an inch in height; and one species, *Thelia univittata*, having a whitish or yellowish stripe along each side, extending from one end to the other. Another species, *Acutalis dorsalis*, of a greenish white color, with a large black spot on the back, is also found on the grape leaves. There are three species of insects belonging to the order *Hemiptera*, or "half-wings," nearly allied to those before named, that are injurious to the vine when they happen to occur in great numbers, which, however, fortunately is not often the case. The insects are from three-eighths to five-eighths of an inch in length, and very nearly the same across the widest part of the body, and are of a green color; and although sufficiently large, one would suppose, to be easily detected, yet so near are some of them to the color of the leaves, that they are often entirely overlooked. They belong to different genera, namely, *Pentatoma*, a grass-green in color; *Raphigaster*, the same color, edged all around with a yellow marginal line; and *Arma*, of a greenish or yellowish gray, with brown punctures on the wing covers, which, in some species, are red towards the ends. These insects, like all of the foregoing, are *haustellated* or suctorial in their habits, stinging the leaves and feeding on the sap. But these do not include all the "sap-suckers" that infest the grape vines, for, in addition to these insects are also various species belonging to the great family *Aphidæ* or "plant lice," especially the *Aphis vitis* and the *Pemphigus vitifolia*, small in size, and generally too well known to need a specific description here. But there are other orders of insects found on grape vines that eat up the buds or the entire foliage, either in their larva or mature states, or in both; and perhaps the most numerous and destructive of these is the "blue grape-leaf beetle." This insect belongs to the order *Coleoptera*, and is the *Haltica chalybea* of authors, and in some localities is known as the "grape-vine flea-beetle." In early spring the adult insects cut off the buds of the vine, and later in the season their larvæ destroy the leaves, and if left alone, they multiply rapidly, and eventually strip the vine of its foliage and destroy the crop. They undergo their transformations in the ground, and the adults hybernate during the winter season, so that their extermination ought to be effected in their larva state; they are then a small brownish bristled worm. Then, in addition to these, and belonging to the same order, we have various species of *Anomala*, about one-third of an inch in length, that feed upon the grape leaves. These insects bear a close resemblance to the famous "rose bug," only more robust in form, and as they are gregarious, and often occur in great numbers, they become very injurious to the vines. The rose-bug itself, *Macrodactylus*, is very often found on the grape vines when they are in bloom, and I have often known them to cause the entire destruction of the crop, by devouring the flowers and buds. Last, not least, of the destructive coleopteras the *Pelidnota punctatæ*, or six-spotted "grape beetle." This is a large brownish yellow beetle, of various shades, found on the vines in the month of July, and is too well known to need a special description at this time.

Of the *lepidopterous* order there are various species that belong to the *Sphinx* family, that in the larva state feed on the foliage of the grape vine. These belong to the genera *Chærocampa* and *Philampelis*, and in their larva state are large cylindrical, fleshy worms, approximating in form to the "tobacco worm," and are of various shades of color, from a pale green to a light velvety brown, with oblong cream-white spots along the sides, and a projecting horn from the upper side of the last segment, pointing backward. The matured insects are large parti-colored "hawkmoths," and they undergo their final transformations under ground. They are found on the grape-vines, eating the leaves and sometimes cutting off the fruit, in August and September. Then we have the larvæ of *Procris americana* and *Alypia 8-maculata*, that infest the grape leaves in colonies; usually found on the under side of the leaf, lying side by side, and moving along in a body, destroying all except the coarser veins as they go. The former is yellow, dotted with black, and the latter is light blue, banded with black. These spin a flat cocoon, side by side on the leaf. The former comes forth in the month of July, a small black moth, with a bright yellow band around the neck; and the latter in May or June, of the same color, but more robust than the former, having yellow shanks, and with two yellow spots on each of the fore wings, and two white ones on each of the hind wings. The latter insect is, however, not so common as the former. The larvæ of the beautiful "wood nymphs"—very much resembling the above named, only larger—are also found on the grape vines. These

belong to the genus *Eudryas*, and are of a milk-white color, with the wings beautifully bordered with brown, and greenish and waved with blue. These insects are not so common as some of the aforenamed. The larvæ of the miller moths sometimes infest the grape vines. These belong to the genus *Spilosoma*, and are of various species. The caterpillars are from an inch to an inch and a half and more in length, and are densely covered with long yellow or white hairs. The mature insects are mostly virgin white, and are commonly called "millers." There are also several species of insects of the order *Orthoptera*, which feed sometimes upon grape leaves, pretty much all belonging to the genus *Œcanthus*, but commonly called "tree crickets." Indeed, all of the insects belonging to this order, except a single species, in this country, are leaf eaters, and it might possibly transpire that they all would eat grape leaves if they could obtain nothing else more palatable. These tree crickets are usually found on the vines in the month of August, but are as often found on other species of vegetation, especially on trees, as they are on the vine, but they somehow cannot be very prolific, as I have never, in twenty-five years, found more than two or three together in the same place. They are only noticed here because they belong to the company of noxious insects that infest the grape vines; and, although they may do little or no harm, yet it is quite certain that they do no good. These insects are mostly of a white, or pale yellowish or greenish tint in color. The females are of a darker color than the males, and might easily be, and no doubt often have been, mistaken for a different species. Their antennæ are exceedingly long and thread-like; the feet are also long and slender, especially the posterior pair, which are more than twice as long as the anterior and medial pair. The wing-covers are shaped like a boy's "bat," and overlap each other horizontally on the back. The total length of the most prominent species (*Œ. niveus*) is about half an inch from the head to the end of the abdomen, but the wings extend a quarter of an inch beyond. Like the "katydid," to which they have a family alliance, they sometimes enter houses in the cool evenings in September, and make a sharp, shrill monotonous noise, which is often continued throughout the night, to the great annoyance of many nervous people. So far as concerns a preventive or a remedy for the foregoing insects, what would be applicable and useful against one species might perhaps be employed with the same efficacy against the whole of them, or any others found upon the grape vines, of which there are a number of species, which space will not permit me to mention in this paper. In enumerating remedies, allow me to remark in the beginning, that boxes put up for wrens and bluebirds, in the grapery, have been found effectual, although not wholly so. Some insects appear in such vast numbers, and multiply so rapidly, that birds seem to have a surfeit of them, and at length to cease capturing and feeding upon them, especially towards autumn, when the ripened fruit begins to appear. Therefore, birds ought not to be depended upon wholly. Syringing with decoctions of tobacco, and saline and saponaceous solutions, ought to be resorted to instead. Much has been claimed quite recently for diluted sharp vinegar—say half and half or two-thirds water, or even three-fourths—according to the particular insects, or the season, and state of the vegetation, to which it is applied. Diluted carbolic and cresylic acid—say a half pint of the acid to a gallon of saponified water—comes recommended as a "sure cure" for nearly all insects. It is claimed, at least, that adult insects will not deposit their eggs where this acid has been employed; besides, it is a good antiseptic and disinfectant. These acids can now be obtained in our drug stores, and sell at about one dollar a pound, which is about three half pints of the fluid acid; but they can also be obtained solid, for about seventy-five cents a pound.

Within the last two days an imposing circular has been placed in my hands, purporting to have been issued by J. Ahearn, No. 63 Second street, Baltimore, Maryland, in which is advertised a new patent remedy for the destruction or prevention of all insects of whatsoever kind that infest vegetation, and especially the different kinds of fruit trees; and for the invigoration of trees, shrubbery, and plants. It is called "*Best's Patent Fruit Tree and Vine Invigorator*," and claims a great deal—perhaps too much—much more, I apprehend, than will ever be realized. I will not condemn it, however, unheard and untried; there may be something in it; moreover, it comes with a large number of horticultural recommenders, principally from Maryland, Ohio, Indiana and Kentucky. From Pennsylvania there is only one—Mr. Nathan W. Secrist, of Middletown, Dauphin county—who, it appears, has purchased the right of that county. I am acquainted personally with only one of these recommenders, and he is a man of intelligence and integrity. It might perhaps be well for fruit-growers to make a trial of this remedy, if they have not already done so; but as I know nothing more of it than what I have seen in print, I can do nothing more than make this suggestion at this time, leaving it optional with those interested to try it or not. A remedy of some kind is so very desirable at the present time, that fruit-growers must submit to the liability of being deceived, in order that a reliable remedy may be discovered, and unreliable ones may be exposed. Whatever the remedy may be, however, in order to be successful, those who use it should apply it perseveringly and judiciously, in order that its true merits may be developed, because an injudicious and partial application may be worse than none at all. Most of the insects mentioned in this paper are more or less preyed upon by insect parasites, so that they may really not be so formidable as they seem, bad as they are; and these parasites render a greater assistance in arresting the multiplication of some species than is apparent to the casual observer. *Trogus fulvus*, a beautiful reddish-brown wasp, with black shining

wings, and about the size of a common paper-making wasp, is parasitic on the larger species of lepidopterous larvæ that infest the grape vines. There are also various minute species of Hymenoptera, belonging to the genus *Microgaster*, that deposit their eggs in the bodies of the *Sphinx* larvæ, in great numbers, which eventually destroys them.

In conclusion, I will mention that there is a species of *fungus* that is found on the grape leaves, which is as bad in its effects as the "leaf hoppers" are, or perhaps any other insect. This, sometimes, may be noticed about midsummer, and continues late in the season, causing the leaves to shrivel up, become crisp and brown and to fall prematurely, exposing the fruit and preventing its ripening. It usually occurs on the lower side of the leaves, and many persons have taken it for the effects of the "hopper," or "thrips," as they call it, but not so; I have seen abundance of it where no insect of any kind was present, and have plainly detected it by the aid of a common magnifier. I have also arrested its progress by the immediate removal of such infected leaves, or parts of leaves, as soon as I discovered them. This fungus is called "mildew," and it, or an allied species, communicates itself also to the fruit, injuring its quality very much. A pair of pruning shears, artistically handled, is the best thing I know of for the cure of this fungus; but by all means burn the leaves as soon as removed.

LOCUSTS OR GRASSHOPPERS IN KANSAS.

S. J. H. Snyder, of Monrovia, Kansas, writes as follows in reference to the grasshopper visitation in that State:

The "Egyptian locusts" or grasshoppers, so called, are assuming a position here as a "regular institution;" our farmers are hopeful, however, that they may finally "fizzle out." The ground on which our faith is based is the fact that they were unknown here prior to the year 1866. I have myself been here all the time since 1854, and neither saw nor heard of them until they made their appearance in that year (1866;) the Indians also assert the same fact. In 1866 they came from the west, being brought here by a westerly wind, which strangely continued to blow from that same quarter for about three weeks, their regular advance being reported to us from Denver, Colorado, by freighters and travellers until they crossed the Big Blue, when in a few days the country was covered with them. The fact is clear that they came from the land of their nativity in the mountains. This season they came from the north or northeast, after a regular wind from that direction of some four days' duration. Their first appearance was in broken sections scattered over the country, but in about a week after, on the 11th instant, the head of the main column advanced with a regularity almost majestic, and pouring down myriads upon myriads of these destroying pests upon the defenceless farmers, who were thus suddenly plunged from the highest joy of an unbounded harvest, into the very depths of painful uncertainty and foreboding ruin! This monstrous column was bounded on the west by a well-defined margin some 14 miles west of St. Joseph, 22 miles west of Atchison, 7 miles west of Monrovia, 3 miles west of Grasshoppers' Falls, 4 miles east of Topeka, and so on in a southwest direction toward the Mississippi, at the mouth of the Osage; its eastern boundary I have not yet learned. Their flight is a very remarkable phenomenon. From about 10 to 4 o'clock each day, while they move, the very heavens are covered as with a pall, sometimes obscuring the sun, the whirling hum of those below resembling an immense number of bee swarms, and their sound that of dim distant thunder. Higher up, where they strike the current, the noiseless, ceaseless tide flows on with a regularity and precision truly astonishing; and when beheld toward the sun the seeming immensity of space in which they move, the instinct that governs their flight, and their countless numbers, fill the mind with a strange admiration and a sense of overwhelming amazement! An attempt to estimate their numbers would be utter folly, and if numbered no finite mind could comprehend a fraction of these countless hosts! Their destruction of vegetation is equally amazing; the tobacco and Jamestown weed (stramonium) are devoured as readily as the cabbage and delicious peach! They are depositing their eggs everywhere, in the mellow, field and in the beaten roadside, and these number still a thousandfold more than the incalculable number of individuals that swarm in myriads all around. I hear that a column has also descended upon the Big Blue and its tributaries, but this needs confirmation.

HUMBOLDT COUNTY, NEVADA.

Our Humboldt, Nevada, correspondent forwards to this Department a copy of the report of the county surveyor and county assessor of Humboldt county,

from which we extract the following paragraph in reference to the agricultural interest:

The area of Humboldt county is about 16,000 square miles, equal to the aggregate area of the States of Connecticut, Rhode Island, Massachusetts and Delaware. There are probably 150,000 acres of tillable and 650,000 acres of grazing land, and the quantity of the former may be greatly increased by irrigation; this has been done already in many places to considerable extent, and at no distant day it will be practiced much more extensively, particularly in that section through which the Humboldt canal is being constructed, and on either side of the Humboldt river. The soil is fertile and requires only irrigation to render it productive for nearly all kinds of cereals and vegetables. A great amount of rich alluvial land can be reclaimed in the lowest part of Paradise valley, by means of a canal through the centre of the same, to carry off the surplus water during the wet season; the soil is of such a character that a canal can be easily constructed. This valley cannot be surpassed in the State for agricultural facilities. It is 35 miles in length and from 6 to 10 miles in width. There are numerous streams in different parts of the valley, that afford ample water for irrigating purposes. This section is pleasantly located, as its name would indicate, and is already a valuable portion of the county. A flouring mill is being erected on Martin's creek, near the head of the valley, at an expense of $15,000. Aside from this valley, Queen's river, Grass and Pleasant valleys, Big Meadows, the Humboldt river section, and the mountain canons, produce large quantities of cereals, vegetables, and hay. The following were the leading productions last year: barley, 2 500 acres, averaging 40 bushels per acre, worth 5 cents per pound; wheat, 1,200 acres, average 40 bushels, 5 cents per pound; potatoes, 50 acres; hay, 3,000 acres, average per acre 1½ ton, worth $20 per ton. There were in the county 900 oxen, 350 cows, 600 horses, 60 mules, 650 stock cattle, 300 calves, 300 hogs, 1,500 sheep, 20 colts. Average price of work oxen per yoke, $150; cows, each, $75; beef cattle, per 100 pounds, on foot, $12; sheep, ditto, $12; hogs, ditto, $12. The county is peculiarly adapted to stock-raising, the rich bunch grass of the mountains, and the blue-joint on the Humboldt river and Big Meadows, growing in abundance during the warm months, and the white sage or "winter pot" is ample for the winter. The tules of the Humboldt river are highly favorable to the raising of hogs, which live and fatten there with little trouble or expense. The Pacific railroad is now running through the whole length of the county.

YUBA COUNTY, CALIFORNIA.

A correspondent in Yuba county, California, writes as follows:

Much of our rich river bottoms have been and are being destroyed by the *debris* coming down from the mines in the mountains. Our streams and rivers are thick with mud, and during high water in winter a heavy sediment or deposit is left on all the bottoms overflowed. The river channels are filled up from 20 to 30 feet, or within a few feet of the bank along these bottoms, so that almost every rise of water overflows the land. Upon these lands were our orchards, the most extensive and celebrated in the State, worth from $25,000 to $250,000. These orchards are beginning to die out. A few trees did not bud in the spring, being dead; the remainder came out and bloomed and set the fruit, and then died, so that the peach crop was a failure. Hundreds of acres are entirely dead, and the remaining trees must die the next or succeeding year. The apple and pear have been but little affected as yet from these deposits; but a year or two more and all the lowland orchards will be destroyed. Hundreds of acres of vineyards have suffered in the same way, so that the crop was an utter failure. Time, however, will work a change, as the higher lands are found to be the best farm lands and the best adapted to fruit if properly cultivated, that is, ploughed deep and well tended. We can well afford to lose the bottoms to gain what were once deemed barren plain and hill lands. Over ten years ago I began to experiment upon these dry plain lands, and for ten years, as president of the agricultural society of the southern district of California, I have warned farmers against planting vineyards and fruit trees upon the lowlands, and urged upon them the feasibility of making homes upon and cultivating the higher lands. During all that time I have urged deep ploughing and summer fallowing, and to-day Yuba county and its vicinity has more acres of dry land under cultivation and does more summer fallowing than any other section of the State. This county suffers more by the loss of her rich bottom lands, but has to-day more wealth in her upland farms than any other county in the State.

THE "DIFFUSION" PROCESS.

Dr. Theodore Canisius, late consul at Vienna, now of Aurora, Kane county, Illinois, (where a beet-sugar enterprise is located,) communicates the following

with regard to the "diffusion process," the discovery of Jules Robert, a sugar manufacturer of Austria, for extracting the saccharine matter from cane, beets, or other sugar-yielding plants:

This process is called "diffusion" from the fact that it is based upon the natural process "*endosmose* and *exosmose*," which means the interchange of two liquids of different components, if these liquids are only separated from each other by an animal or vegetable cell-membrane. Where such two different liquids, as before stated, are brought into close contact and only separated by the membrane of a cell, an interchange of the liquid outside the cell and of the liquid within the cell takes place till both liquids become identical in their composition. Scientific men call this natural process "membrane diffusion."

It is well known that the cane consists of a large number of cells, differing in size and form, and the contents of which are of a different nature according to the quality and situation of the cell. Within those cells are, as well as the sugar, the salts, in short, all the soluble matters which we find in the liquor obtained by our sugar mills, as also the insoluble substances remaining in the bagasse or offal. Each cell is enclosed by a membrane, as already remarked, giving it its shape and form. This membrane, however, is not absolutely closed; it has very minute perforations of larger and smaller dimensions, but the greater number are very small. We, therefore, may compare the cell membrane with a fine sieve, or with a sack of delicate, loose, and irregular texture, containing corpuscles of different sizes, and which corpuscles may, under favorable circumstances, leave their enclosure with more or less facility, in exact proportion to the size of the perforations in the sieve-like cell-membrane. The large corpuscles within the cell-membrane must necessarily meet with more hindrance to escape through the cell-wall, for the reason that the cell-membrane has a greater number of very minute perforations than of large ones, in consequence of which the large corpuscles escape with difficulty, while the small corpuscles or grains, (the so-called *crystalloides*,) pass without hindrance through the minutest perforations of the cell-membrane.

The relative proportion of the sizes, the volumina of the said corpuscles in the juice, like sugar, salts, albumen, &c., can only be found out by the atom weight and the specific weight of those minute bodies, and the way of calculating it is to divide the ciphers representing the atom weight by the ciphers rep resenting the specific weight. Without entering further upon such calculation I will remark that bodies of a high atom weight, but small specific weight, like gum, pectin—the gelatinizing principle of plants—albumen, &c., have a large atom volume and represent the large or coarse particles of the cell, while bodies of small atom weight, but large specific weight, like sugar, salts, &c., representing, consequently, finer corpuscles or grains, have a small atom volume. It is therefore apparent that the liability of soluble chemical compositions to leave their cell, or, according to our example, to go through the small meshes of the cell wall, is the greater the smaller the atom weight of the corpuscles is. We find, under otherwise identical circumstances, that this liability exists in a higher degree in such corpuscles which crystallize, like sugar, salts, asparagin, &c., and termed crystalloides, than in corpuscles not crystallizable, like gum, pectin, albumen, &c., termed by scientific men colloides. In short, the tendency of the matter within the cell membrane to leave this enclosing wall is increased proportionately with the smallness of the atom volume and the readiness of such matter to crystallize.

We see by the above that the extraction of the saccharine matter from the cane or beets by means of "diffusion" is a microscopical, sifting process, entirely different from all other methods now in use in the European beet sugar manufactories or the American cane mills to extract the saccharine matter from the sugar plants. This sifting out of the corpuscles within the cell membrane is done through the aid of water. It is clear that through the application of

the diffusion process not only particles within the cell wall will find their way out of the perforated membrane, but that also some portions of the water surrounding the cell membrane will penetrate through the minute meshes of the cell membrane into the cell to fill up the room vacated by the corpuscles which left the cell. This process goes on without intermission until on each side of the cell wall two liquids are formed, identical in their compositions. As soon as this is the case an equilibrium between the liquids out and inside of the cell has taken place, and a further exchange of water and crystalloides is not any longer possible. When the liquid on the outside of the cell membrane is removed and replaced by fresh water the sifting process begins anew, until again an equilibrium is effected, and so on, till finally all the crystalloides have left the cell.

The water which finds its way into the cell exercises, according to scientific and microscopical investigations, a special influence upon those particles in the cell membrane termed coarse-grained bodies or colloides, which are non-crystallizable substances; namely, it coagulates the same into one mass as soon as the crystalloides interlining or separating the colloides from each other have left the cell membrane, thus rendering the non-crystallizable matter unable to penetrate through the meshes of the cell wall.

Technical chemistry has a procedure by which the foregoing may be well illustrated. It is called the "Bahmil flour trial." The wheat flour contains principally starch and gluten, being in an intimate intermixture in the flour. If we enclose a small quantity of wheat flour—say a teaspoonful—in a piece of fine silk bolting cloth, and tie this up in the form of a little bag, we can, by pressing and kneading it under a constant stream of water, with the hands wash out all the starch of the flour through the minute meshes of the cloth, while the gluten coagulates into an adhesive paste, which can be drawn out to long threads. This procedure gives us a beautiful illustration of the diffusion process, for the perforated cane or beet cell membrane will, under the application of water, allow the sugar and salts (corresponding to starch) to pass through the meshes of the cell membrane, while the coarser matters (albumen, pectin, &c., corresponding to the gluten of the wheat flour) coagulate in the cell to one body. The diffusion process may, therefore, justly be termed a sifting process, of which the result is on the one hand a sifted out liquor, furnishing the sugar, and on the other a sieve-like membrane containing the colloides and forming the offal or bagasse.

It can readily be seen that the liquor obtained in this way has become already, through the action of the cell membrane itself, relatively a pure juice, from the simple fact that those particles which do not form sugar are retained in the cell membrane, an advantage doubtless appreciated by persons who know what it is to purify the liquor obtained in cane mills by the pressing and centrifugal process.

The new process will doubtless bring about an entire revolution in the manufacture of sugar. The old processes destroy the cell membrane in order to obtain the saccharine matter, by which procedure the manufacturer receives a liquor mixed with all the impurities the beets or the cane contain. The old methods are also extremely expensive, the machinery to get the liquor from the cane or beets being costly and requiring constant repairing; and besides the purification of the filthy juice requires great labor and expense.

BRITISH RECEIPTS OF COTTON AND WHEAT IN 1868.

The trade and navigation returns of Great Britain afford encouragement to the cotton-growers of the United States. The exhibit of receipts from this

country are more flattering than those of last year. The increase is 4 per cent. for the period between January 1 and September 30. They constitute 55 per cent. of the total receipts from all quarters.

On the other hand, British India, for the same period, has suffered a diminution of cotton exports amounting to 26 per cent. Turkey shows a still greater falling off, 43 per cent. Egypt, with all her efforts, including the introduction of steam ploughs, sends 5 per cent. less than last year. Only Brazil makes an increase. The decrease from other sources of supply averages 20 per cent. The following is the statement of receipts for nine months of 1867 and 1868:

Cotton, raw, from—	1867.	1868.
United States.....cwts	4,188,054	4,362,983
Bahamas and Bermuda.....do..	10,439	474
Mexico.....do..	22	.....
Brazil.....do..	504,284	689 511
Turkey.....do..	55,560	32,345
Egypt.....do..	891,398	842,521
British India.....do..	2,963,850	2,187,359
China.....do..	4,707	.....
Other countries.....do..	225,919	178,856
Total.....	8,844,233	8,294,049

The exhibit of receipts of wheat from this country for the same period shows equally gratifying figures, as compared with the receipts to the same date in 1867, the increase reaching nearly 140 per cent., while the receipts from Russia show a falling off of about 28 per cent.; Prussia 38 per cent. decline, and Chili 33 per cent. decline. Turkey and Wallachia and Moldavia show an advance of 30 per cent., and Egypt 350 per cent. The following figures show the total receipts in cwts. of wheat from the countries named for the nine months ending September 30:

Countries.	1867.	1868.
Russia.....cwts	9,916,855	7,142,034
United States.....do..	1,980,007	4,714,203
Prussia.....do..	4,698,876	2,909,271
Turkey and Wallachia and Moldavia.....do..	1,792,489	2,882,596
Egypt.....do..	635,169	2,870,068
Chili.....do..	1,740,631	1,153,006

AGRICULTURAL COLLEGES AND MODEL FARMS.

J. H. McChesney, United States consul at Newcastle-upon-Tyne, in a letter to the Commissioner upon the subject, says:

I have visited the Royal Agricultural College at Cirencester, and my judgment as to the expediency of carrying on a model farm in connection with an agricultural college is fully sustained by the experience of that institution. They owned a farm of over 500 acres, and for some years conducted it in connection with the college as a model farm, and though entirely distinct from their experimental grounds, which, of course, are never expected to pay, they not only did not make it pay anything, but lost a large amount of money by it. As long as they permitted the institution to be burdened by this and other bad practices, they no more than maintained an existence. For 20 years they struggled against bad fortune. The farm is now let to an educated farmer, one of their own graduates, with the reserved right to visit it with their students, and the farm pays the tenant, though he has high rental expenses to pay, and answers the college equally well, and the college may now be said to be in a prosperous condition. I believe model farms in all cases to be detrimental to the prosperity of agricultural colleges if attempted by the institution.

COAL ASHES AS A FERTILIZER.

A series of experiments has been in progress at the Museum of Natural History, Paris, during the past season, under the eye of Professor Naudin, to test practically the value of coal ashes as a manure, the results of which seem to confirm the opinion that for such purpose coal ashes are worthless, if not actually injurious to and destructive of plant life. The first experiment was with haricot beans planted in three pots, one of which was filled with coal ashes, another with sandy heath-earth of middling quality, and a third with a mixture of heath-soil and coal ashes in the proportion of three parts of heath-soil and one of coal ashes, three beans being planted in each pot and all of which were sunk in a plot bed and given the same attention. All the beans germinated at the same time, but those in the pure coal ashes had more difficulty in vegetating and developing their first leaves, and from the first were sensibly behind those in the other pots, and soon one of them turned yellow and perished. The plants in the heath-soil produced eleven beans, those in the mixed earth seven, while those in the pure coal ashes made a sorry figure. Their stems did not exceed four and three-fourths inches in height, and one of them was nothing more than a staddle without leaves while the other still preserved their yellow leaves; on each of their stems were three or four flower buds which fell off without opening. Like experiments followed with watermelon seeds, maize, varieties of grasses, &c., with similar results. The last experiment was with the haricot beans again. Two large pots were filled, one with good free earth, the other with equal parts of the earth and coal ashes, and three beans planted in each. Another bean was planted in the open ground of the ridges where the pots were sunk. All the beans germinated, but the plants in the pot containing the coal ashes were weaker than the others. Those in the pot of pure earth became relatively very fine. On the 28th of September, though still green and full of leaf, almost all the pods had reached their normal development and it was easy to reckon their grains. The plants were cut off at the level of the neck and put upon the scales. The three plants grown in the mixture of earth and coal ashes weighed together 78 grams, or an average of $17\frac{3}{4}$ dwts., and bore 8 pods containing 20 developed grains. The three plants in the pot of earth alone weighed 320 grams, or an average of 3 ounces $8\frac{1}{2}$ dwts. each, and bore 20 matured pods, (besides 4 or 5 small, young pods) containing 59 grains; being more than triple the product of the three plants raised in the mixture of earth and coal ashes. The plant from the single bean planted in the open ground weighed 243 grams, (7 oz. 16 dwts.) and bore 15 fine pods, containing 42 beans. Professor Naudin concludes from these experiments that for any of the plants tested coal ashes have been neither a manure nor even an earth of the most infertile quality.

AGRICULTURAL STATISTICS OF AUSTRALIA.

The land alienated from the crown during the year 1867 amounted to 144,021 acres, bringing up the total to 3,568,724, giving an average of nearly 21 acres to each man, woman, and child of the population. The enclosed land amounts to 4,712,276 acres, being an advance of 173,187 acres upon the previous year. The wheat crop of the year, through red rust, was reduced to an average of $4\frac{2}{3}$ bushels per acre, or $9\frac{3}{4}$ bushels less than the preceding year, and all other cereals showed a comparative decline in average product. The acreage in wheat was 20 per cent. greater in 1867 than in 1866, and monopolized 68 acres out of every 100 acres under cultivation, yet the crop proved little more than a nominal improvement upon that of 1858–'59 when the area sown was two-thirds less.

There were 3,499 acres in peas against 1,853 bushels the previous year, and the average yield per acre was 10 bushels 23 pounds. Fallowed land exhibited a falling-off of 10,280 acres. In orchards and gardens there has been an increase of 652 acres, there being now 2,563 of the former and 3,912 of the latter. Vineyards show a decline of 152 acres. The total acreage in vines is 6,209, with 5,869,406 vines in bearing, and 1,022,740 vines yet unproductive. The quantity of wine made is returned as 863,584 gallons, or 128,601 gallons more than at the previous vintage. The production of the past three vintages has averaged 816,000 gallons, or nearly 5 gallons per head of the population. The shipment of wine amounted to 8,924 gallons, valued at £1,901, against 20,574 gallons, with £50,545, in 1862. The produce of an acre of vines is returned as 140 gallons. A large increase in the number of sheep is reported, over half a million, and the diminution in the number of horned cattle, so rapid of late years, has reached its limit, being for the past year merely nominal. Since 1863 the number of cattle has decreased one-half, whereas for the past five years the increase in the flocks has been 30 per cent. More attention is now being paid to dairy products for the supply of the home market and for exportation.

AMERICAN CORN IN PRUSSIA.

Experiments made with samples of corn sent out from this Department, through Q. H. Brockman, United States consul at Koenigsberg, Prussia, for trial in that country, have been attended with but limited success.

The varieties sent were Darling's Early sugar corn, Stowell's Evergreen sugar corn, large sugar corn, Adams's Extra Early corn, improved seed corn, and King Philip. At the agricultural academy in Popellau, near Rybrick, Upper Silesia, the King Philip alone ripened, but this variety turned out of superior quality and its cultivation will be continued. The Central Association of West Prussian agriculturists, at Dantzic, reports that though the season was unfavorable, the summer wet and cold, the 40-days corn generally, and the King Philip corn in the greatest part, reached maturity, whilst white corn, white Canadian, and even the red and the versicolor Silesian corn did not ripen. The large sugar corn, Stowell's Evergreen, Darling's Early, and Adams's Extra Early, also failed to mature. Mr. Stetter, a large landholder in Great Mischen, near Koenigsberg, reports that ears formed on the stalks, but the grains contained no starch and were milky. At the experimental farm of the Royal Academy of Agriculture in Waldau, none of the varieties ripened fully before the heavy frosts, but were soft and soon moulded, though the ripest grains were removed from the ears and dried in a moderately warmed room, to be used for seed another season.

HAMPSHIRE DOWN SHEEP.

The following points have been gleaned from a private note to the Commissioner of Agriculture by Robert Morrell, of Manhasset, Long island, New York. His imported ram Chancellor is pictured in the report of 1867. Chancellor was dropped in Quebec, March 23, 1865, out of an ewe imported by John Ashworth, esq., in 1864, from the flock of Edward Hetherington, of Surrey, England, and got by ram "Pride of England," purchased by John Hetherington, in Arlingford, Hampshire, England. The ewes will clip 5½ pounds washed wool, and rams 6½, the quality of wool about the same as Southdown, only longer.

The demand for Hampshire rams, "for crossing for mutton sheep," is greater than I have been able to fill, and have been compelled to rent out my breeding rams in order to accommodate farmers that have been depending on me for this year's lambs.

The sale of 170 Hampshire Down ram lambs, which took place at Basingstoke market a short time since, throws all sales which have preceded it into the shade. The lambs realized over £11 11*s.* per head all around.

The Hampshire Chronicle, an agricultural paper published at Winchester, in the south of England, states that in 1822 the late Mr. George Budd, father of the present owner of the Hatch Warren flock, founded the valuable breed of sheep now so celebrated as "Hampshire Down."

METEOROLOGY.

[Compiled in the Department of Agriculture, from reports made by the observers o the Smithsonian Institution.]

OCTOBER AND NOVEMBER, 1868.

Table showing the highest and lowest range of the thermometer, (with dates prefixed,) the mean temperature, and amount of rain fall, including melted snow, (in inches and tenths,) for October and November, 1868, *at the stations named. Daily observations made at* 7 *a. m., and* 2 *and* 9 *p. m.*

[We go to press on the 17th—reports received after 14th must be omitted in the Notes, those after the 17th will be used in the Annual Report and in the Smithsonian Reports.]

States and places.	October, 1868.						November, 1868.					
	Date.	Max. temp.	Date.	Min. temp.	Mean temp.	Rain fall.	Date.	Max. temp.	Date.	Min. temp.	Mean temp.	Rain fall.
MAINE.		°		°	°	*In.*		°		°	°	*In.*
Steuben	8	62	24, 31	18	41. 2	3. 24	1	53	17	11	31. 8	5. 69
West Waterville	8	72	24	21	42. 7	0. 70	1	57	17, 28	16	32. 4	7. 90
Gardiner	8	67	31	22	43. 5	0. 98	1	56	17	17	33. 7	6. 76
Standish	8	74	30	24	44. 2	1. 20	1	56	17	18	34. 4	6. 91
Norway	8	74	31	16	41. 6	.....	1	54	17	10	31. 0	.....
Cornish	8	74	24	18	42. 3	1. 13	1	52	28	13	31. 2	5. 65
Cornishville	8	72	30	24	42. 9	0. 65	1	54	28	16	32. 0	6. 64
Averages	.....	.....	.....	.....	42. 6	1. 32	.....	.....	.....	.....	32. 4	6. 59
NEW HAMPSHIRE.												
Stratford	5	64	24	10	39. 6	1. 29	1	50	17	5	27. 6	6. 88
Shelburne	8	72	24	14	43. 0	1. 70	1	57	18	20	32. 6	.....
North Barnstead	8	71	24, 30	25	45. 4	1. 51	4	48	17	24	34. 8	2. 87
Goffstown Centre	8	72	18, 24	25	48. 2	1. 60	1	56	17	23	36. 8	5. 60
Averages	.....	.....	.....	.....	44. 1	1. 53	.....	.....	.....	.....	33. 0	5. 12
VERMONT.												
Lunenburg	7	65	30	15	41. 6	1. 30	1	54	17, 30	14	29. 6	7. 15
North Craftsbury	5, 11	60	30	11	37. 4	1. 20	1	48	17	10	27. 4	5. 84
Randolph	8	63	30	15	41, 6	0. 45	.....	.....	.....	.....	.....	.....
Woodstock	11	62	24	11	39. 5	.....	1	53	4, 23	14	29. 9	.....
St. Albans	11	69	30	16	41. 8	.....	1	46	16	16	30. 2	.....
West Charlotte	11	68	24	22	46. 0	2. 19	1	51	17	21	34. 5	8. 88
Middlebury	11	63	24	23	43. 6	1. 10	1	51	30	18	32. 5	6. 38
Averages	.....	.....	.....	.....	41. 6	1. 39	.....	.....	.....	.....	30. 7	7. 06
MASSACHUSETTS.												
Kingston	8	75	24, 30	28	50. 1	2. 25	1	65	17	27	42. 2	3. 62
Topsfield	8	73	31	18	44. 7	0. 95	1	60	17, 28	20	34. 6	4. 88

Table showing the range of the thermometer, &c., for Oct. and Nov.—Continued

States and stations.	October, 1868.						November, 1868.					
	Date.	Max. temp.	Date.	Min. temp.	Mean temp.	Rain fall.	Date.	Max. temp.	Date.	Min. temp.	Mean temp.	Rain fall.
MASS.—Continued.		°		°	°	*In.*		°		°	°	*In.*
Lawrence	8	73	24, 31	24	44.7	1.56	.....	.....	.....	.....	.....	.....
Georgetown	11	73	23, 24, 31	23	45.3	1.52	14	65	3	17	36.3	5.60
Milton	8	72	24	22	47.0	1.66	1	57	17	20	36.6	4,49
Cambridge	11	78	24	22	48.2	.....	4	60	17	22	37.8	.....
North Billerica	8	76	24	16	45.1	.....	1	58	16, 17	19	35.5	.....
West Newton	8	80	24	20	48.2	.....	1	64	13, 28	22	37.4	.....
New Bedford	8	70	30	27	49.1	1.61	15, 9	57	16, 28	26	40.5	2.85
Worcester	8	73	24	26	46.2	1.14	2	58	16, 28	25	37.6	4.24
Mendon	8	70	24	22	45.0	1.40	1	57	16, 17	22	36.2	3.25
Lunenburg	8	75	24	21	45.5	1.28	1	55	16	20	35.2	4.90
Amherst	11	68	24	19	45.3	1.37	1	58	20	24	36.5	4.80
Richmond	.....	.....	.....	.....	.....	.....	9	53	7	20	35.7	6.40
Williams College	11	69	24	18	47.5	0.94	9	61	30	22	36.0	4.42
Hinsdale	5	66	30	16	40.0	.....	9	57	16	19	33.9	4.35
Averages	.....	.....	.....	.....	46.1	1.43	.....	.....	.....	.....	36.8	4.48
RHODE ISLAND.												
Newport	7	72	24	24	48.4	2.07	9	56	17	24	39.4	4.32
CONNECTICUT.												
Pomfret	8	70	24	21	44.6	0.70	9	62	16, 17	24	36.6	4.42
Columbia	8	76	24	22	48.7	.....	9	64	17, 27	28	39.6	.....
Middletown	8	75	24	25	47.3	0.89	9	67	17, 28	24	38.5	3.85
Colebrook	5	69	30	20	43.7	.....	9	65	28	21	35.1	.....
Waterbury	8, 11	67	24	21	45.7	0.74	9	66	28	22	38.5	4.94
Brookfield	11	70	24	22	48.5	1.20	9	70	28	22	38.9	3.50
Averages	.....	.....	.....	.....	46.4	0.88	.....	.....	.....	.....	37.9	4.18
NEW YORK.												
Moriches	5	78	24, 30	31	54.1	1.00	9	66	28	24	45.1	5.54
South Hartford	11	65	30	21	46.2	2.81	9	59	17, 30	22	36.5	8.30
Troy	11	71	30	26	47.0	1.58	9	58	30	26	38.3	4.94
Garrison's	11	70	24	27	47.0	1.05	9	70	28	26	39.2	6.42
Throg's Neck	11	68	24, 30	32	.....	.....	9	67	23, 28	30	42.0	.....
White Plains	9	75	18, 24	30	50.7	.....	9, 10	70	24	27	42.9	.....
Deaf and Dumb Ins.	11	67	18	30	50.0	2.01	9	66	13, 23	30	42.1	5.13
Columbia College	19	69	30	32	51.3	0.88	9	65	23	30	42.4	3.46
Flatbush	11	68	24	31	50.5	2.66	9	67	28	29	39.8	4.03
Newburgh	11	71	17, 18, 23, 24, 30	34	50.9	0.72	9	70	16	29	41.9	4.28
Minaville	11	67	30	20	42.9	2.16	1	54	30	17	32.4	5.81
Gouverneur	7	68	30	15	42.3	1.95	13	46	23	15	32.0	5.13
North Hammond	10, 14	70	30	23	47.3	1.59	1	56	23	20	35.2	6.37
Houseville	7	64	30	18	42.1	4.18	4	49	30	14	33.4	4.95
South Trenton	6	63	29, 30	24	42.6	2.49	27	44	3	22	32.6	4.74
Cazenovia	5	67	29, 30	24	43.4	.....	10	59	30	15	35.5	.....
Oneida	7	68	29, 30	25	42.0	2.47	4	53	30	19	36.0	10.64
Depauville	7	70	30	23	43.2	3.60	4, 14	50	23	18	34.1	6.09
Oswego	7	68	30	26	45.6	0.92	13	49	30	22	37.4	6.44
Palermo	7	71	30	20	43.4	1.40	4	51	30	15	34.4	6.63
North Volney	7	72	29	24	45.2	.....	.....	.....	.....	.....	.....	.....

Table showing the range of the thermometer, &c., for Oct. and Nov.—Continued.

Sta es and stations.	October, 1868.						November, 1868.					
	Date.	Max. temp.	Date.	Min. temp.	Mean temp.	Rain fall.	Date.	Max. temp.	Date.	Min. temp.	Mean temp.	Rain fall.
NEW YORK—Con'd.		°		°	°	*In.*		°		°	°	*In.*
Nichols	5	72	18, 30	23	45.7	.....	9	66	30	24	38.3	.....
Newark Valley	5, 7, 11	66	24, 30	22	43.4	.....	9, 10	60	30	20	35.7	.....
Rochester	7	73	18	27	44.3	1.67	4	52	30	24	37.5	4.42
Little Genesee	7	74	18	18	45.3	2.25	10	64	30	22	36.8	2.25
Suspension Bridge	7	76	18	28	46.4	3.60	.....	.....	.....	.....	.....	.....
Buffalo	7	76	29	27	47.2	2.55	4	57	30	22	38.2	4.92
Averages	.....	.....	.....	.....	46.5	2.07	.....	.....	.....	.....	37.6	5.52
NEW JERSEY.												
Paterson	11	69	24, 30	27	49.3	1.31	9	70	23, 28	27	41.2	5.05
Newark	11	67	24	28	49.8	1.25	9	68	13, 23	29	42.3	4.38
New Brunswick	11	69	24	29	48.8	1.34	9	66	28	26	41.7	4.89
Trenton	8	70	18, 30	32	53.5	3.21	10	70	28	28	45.7	5.00
Moorestown	1	72	24	28	51.4	1.62	10	75	28	25	43.0	4.91
Elwood	8	78	18	24	53.9	.....	10	73	28	23	43.6	.....
Dover	5	67	18, 24, 30	29	49.2	1.15	9	71	13	26	41.6	4.82
Haddonfield	11	67	24	31	51.2	1.58	9	66	28	30	43.3	5.60
Newfield	1	80	18, 24	27	52.2	.....	10	75	28	21	42.6	.....
Greenwich	1	70	18	32	53.4	0.72	10	73	13, 28	30	44.8	6.39
Vineland	1, 5	78	18	25	53.5	1.08	10	77	28	26	43.7	7.24
New Germantown	.....	.....	.....	.....	.....	.....	9	70	13	23	39.8	6.70
Averages	.....	.....	.....	.....	51.5	1.47	.....	.....	.....	.....	42.8	5.50
PENNSYLVANIA.												
Nyces	9	70	30	18	44.6	2.05	9	66	28	16	31.5	5.10
Fallsington	10	71	24	31	51.7	1.60	10	72	13	29	43.3	4.70
Philadelphia	1	70	18, 24	35	53.4	2.24	10	72	23	35	45.9	4.53
Germantown	12	77	24	29	51.2	.....	10	75	12, 13, 22, 23, 24	29	42.2	.....
Horsham	11	70	24	29	50.5	1.67	9	71	28	27	42.8	6.35
Plymouth Meeting	11	70	24	29	51.1	.....	10	71	13, 28	27	42.8	.....
Dyberry	5	69	18, 30	20	43.3	.....	.....	.....	.....	.....	.....	.....
Whitehall	11	65	24	24	48.1	.....	9	68	28	25	41.8	.....
Factoryville	11	68	18	20	44.8	1.02	10	65	24	22	37.2	4.22
Reading	1, 6, 11	69	18, 24	31	51.6	.....	9, 10	73	28	30	44.1	.....
Parkesville	13	69	24	27	52.4	1.56	10	70	23, 28	30	42.3	4.56
West Chester	1	68	18, 24	33	52.0	1.16	10	72	12, 13, 23, 28	33	45.1	5.47
Silver Spring	1, 11	72	24	25	50.7	.....	10	78	28	26	42.4	.....
Mount Joy	11	72	18	28	50.9	.....	8	86	13, 14	31	46.1	.....
Harrisburg	7, 11	68	24	30	51.0	0.60	9, 10	67	28	31	43.3	6.22
Fountain Dale	1, 11	70	18	30	49.5	1.60	9, 10	72	28	28	42.5	5.12
Tioga	1	68	18	12	41.6	2.15	9, 10	60	30	18	33.6	4.80
Lewisburg	11	68	18	24	46.8	0.83	10	68	14, 28	25	39.7	5.40
Ickesburg	11	74	30	23	48.5	0.88	9, 10	70	28	20	41.3	6.86
Grampian Hills	13	68	18	17	43.5	2.96	4, 9, 10	60	28	20	35.5	3.26
Johnstown	1	67	30	29	46.8	1.97	8, 9, 10	60	24	23	38.8	.....
Franklin	7	73	18	22	46.4	2.68	9	62	27	24	38.2	4.45
Connellsville	7	78	18	20	49.5	.....	9	68	3	24	40.1	.....
New Castle	2, 7	70	18	22	50.2	.....	9, 10	64	27	24	41.2	.....
Beaver Seminary	7	74	18	26	50.3	0.50	9	67	3	28	42.6	3.10
Canonsburg	7	77	18, 24	25	50.0	1.52	.....	.....	.....	.....	.....	.....
Averages	.....	.....	.....	.....	48.9	1.59	.....	.....	.....	.....	41.0	4.94

Table showing the range of the thermometer, &c., for Oct. and Nov.—Continued.

States and stations.	OCTOBER, 1868.						NOVEMBER, 1868.					
	Date.	Max. temp.	Date.	Min. temp.	Mean temp.	Rain fall.	Date.	Max. temp.	Date.	Min. temp.	Mean temp.	Rain fall.
MARYLAND.		°		°	°	*In.*		°		°	°	*In.*
Woodlawn	11	74	18	30	52.2	2.10	10	72	3, 13, 28	30	43.8	8.42
Annapolis	1	71	18	31	56.1	1.57	10	74	28	28	48.4	5.49
St. Inigoes	7	74	23	36	54.5	0.68	.....	.....	.....	.....	.....	.....
Emmittsburg	11	78	18	22	49.9	.....	9	76	13, 28	24	42.1	.....
Mt. St. Mary's Col.	11	69	24	29	49.9	1.97	9	72	28	28	42.1	5.87
Averages	.....	.....	.....	.....	52.5	1.58	.....	.....	.....	.....	44.1	6.59
VIRGINIA.												
Surry C. H	7	83	23	33	59.5	.....	10	82	24	25	48.4	.....
Johnsontown	1, 8	76	18	36	57.7	.....	10	77	13	32	49.3	.....
Comorn	1	75	24	34	55.7	1.10	9, 10	74	19, 23, 24	32	45.8	2.55
Mt. Solon	1	78	18, 23, 29	32	56.5	4.00	.....	.....	.....	.....	.....	.....
Lynchburg	1	72	18	37	57.2	.....	10	72	28	33	48.7	.....
Snowville	11	75	13	24	51.4	17.20	10	71	13, 24	20	40.6	5.60
Wytheville	11	76	23	26	53.3	2.55	7, 8, 9, 10	68	13, 28	21	39.8	1.25
Staunton	1	74	18, 23	35	53.0	2.88	9	75	13, 14, 24, 28	29	43.8	2.32
Averages	.....	.....	.....	.....	55.5	5.55	.....	.....	.....	.....	45.2	2.93
WEST VIRGINIA.												
Romney	1	78	18	26	51.2	.....	9	76	28	22	42.4	.....
White Day	2, 7	84	18	26	55.3	.....	8	75	23	26	46.0	.....
Averages	.....	.....	.....	.....	53.3	.....	.....	.....	.....	.....	44.2	.....
NORTH CAROLINA.												
Kenansville	14	82	23	38	62.2	11.22	.....	.....	.....	.....	.....	.....
Goldsboro'	7, 8	82	23. 24	38	61.2	5.00	10	77	24	28	50.1	1.60
Raleigh	1, 14	85	25	35	60.5	3.75	8, 10	78	13, 14	29	49.6	1.45
Oxford	2	78	18, 24	30	56.5	1.80	10	75	14	27	45.6	2.10
Albemarle	8, 12	83	24	28	57.2	5.54	10	82	23	18	44.5	1.00
Statesville	1, 2, 11, 13, 28	70	24	29	54.7	5.25	10	72	23	20	41.6	2.00
Asheville	11, 12	75	23, 24	31	55.6	.....	9	70	14	21	42.5	.....
Averages	.....	.....	.....	.....	58.3	5.43	.....	.....	.....	.....	45.7	1.63
SOUTH CAROLINA.												
Aiken	8	79	23, 24	42	.....	3.57	11	79	21	33	.....	.....
Gowdysville	8	82	23, 25	37	62.0	.....	10	78	21	30	51.2	.....
Averages	.....	.....	.....	.....	62.0	.....	.....	.....	.....	.....	51.2	.....
GEORGIA.												
Atlanta	12	76	24, 25	35	55.7	8.87	9	74	13, 27	27	44.2	3.12
Macon	.....	.....	.....	.....	.....	.....	10	75	21, 23	31	50.1	0.51
Averages	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	47.2	1.82
ALABAMA.												
Opelika	11	87	20	43	62.7	9.75	9	78	23	25	48.8	2.94
Carlowville	7	82	24	46	65.4	17.06	9	79	21	28	52.2	3.44
Moulton	1	76	23	24	58.5	1.58	9	69	21, 23	28	46.1	3.00
Greene Springs	7	78	23, 25	39	61.9	7.17	8	72	21	26	47.1	4.17
Havana	1	80	25	40	62.6	10.00	8	73	21	26	48.0	3.45

Table showing the range of the thermometer, &c., for Oct. and Nov.—Continued.

States and stations.	October, 1868.						November, 1868.					
	Date.	Max. temp.	Date.	Min. temp.	Mean temp.	Rain fall.	Date.	Max. temp.	Date.	Min. temp.	Mean temp.	Rain fall.
ALABAMA—Cont'd.		°		°	°	*In.*		°		°	°	*In.*
Fish River	5	83					9	76	21, 22	34		
Averages					62.2	9.11					48.4	3.40
FLORIDA.												
Jacksonville	8	88	24, 26	55	72.9	3.20	10	85	21	35	58.8	0.25
TEXAS.												
Gilmer	3	88	22	38	66.9	2.14	4	80	21	29	51.5	6.68
Houston	7, 14	79	9, 26, 29	60	70.2		3, 8, 9	76	17	55	64.6	
Columbia	14, 15	93	9	47	71.2	3.63	9	88	11	35	58.1	5.97
Waco	6	88	23, 25	47	67.3	4.80	8	83	17	32	54.4	3.05
Austin	5	93	24	45	69.0	4.65	8	83	12	34	55.7	4.17
Averages					68.9	3.81					56.9	4.97
LOUISIANA.												
Benton	14, 16	82	9	42	65.9							
New Orleans	12	86	24	60			9	79	21	42		
MISSISSIPPI.												
Grenada	1, 6, 7	80	23	37	62.6		8, 9	78	21	27	51.3	
Brookhaven	13	82	23	44	63.0		9	79	21	28	51.5	5.67
Natchez	1	80	23	40	66.7	2.85	9	79	21	28	51.5	5.67
Averages					64.1	2.85					51.4	5.67
TENNESSEE.												
Elizabethton	13	80	22, 23	28	56.9		10	74	12	24	42.8	
Lookout Mountain	6. 7, 12	74	9	42	60.1		9	72	20	26	48.7	
Austin	7	82	23	32	57.8	0.75	9	78	12, 19, 23, 28	28	45.2	3.65
Clarksville	7	77	28	33	56.0	1.56	8	74	23	25	44.7	2.02
Memphis	1	85	23	36	59.1	0.06	8	78	23	26	46.8	2.14
Averages					58.0	0.79					45.6	2.60
KENTUCKY.												
Pine Grove	2	78	18, 23	28	54.0	2.02	9	74	12, 20, 23	26	42.4	2.33
Lexington	2	76	18	29	54.2	1.95	9	74	12	24	43.0	3.24
Danville	2	88	18, 23	35	60.4	1.53	9	79	12	24	47.3	2.28
Louisville	2	81	23	30	55.5	1.95	9	76	12, 23, 27	24	44.4	2.26
Clinton	7	78	9	31	55.5	2.25	9	75	23	21	42.8	1.95
Averages					55.9	1.94					44.0	2.41
OHIO.												
New Lisbon	2	76	18	20	51.5	1.19	10	80	3	22	44.5	2.58
Steubenville	7	74	18	27	52.0		9	69	3, 27	29	43.2	
Painesville	7	70	9, 17, 18, 24	32	47.0	2.06	4, 9	56	30	28	40.4	5.55
Milnersville	7	75	23	26	48.7		9	71	27	19	38.4	1.86
Cleveland	7	75	18	29	48.3	1.09	16	66	27	27	40.3	3.73
Wooster	5, 7	78	18	27	51.5	0.52	9	67	27	24	42.2	2.45
Smithville	5, 7	74	18	26	50.3							
Gallipolis	2	80	18, 23	28	53.3	1.15						
Kelley's Island	7	73	23	32	50.8	0.78	4	59	18, 19, 20	31	41.8	2.24

Table showing the range of the thermometer, &c., for Oct. and Nov.—Continued.

States and stations.	October, 1868.						November, 1868.					
	Date.	Max. temp.	Date.	Min. temp.	Mean temp.	Rain fall.	Date.	Max. temp.	Date.	Min. temp.	Mean temp.	Rain fall.
OHIO—Cont'd.		°		°	°	*In.*		°		°	°	*In.*
Sandusky	7	73	23	25	49.0	1.12	4	59	27	27	39.7	2.57
Norwalk	7, 30	72	18, 23	26	48.8	0.31	3	67	27	27	41.3	1.94
North Fairfield	5	72	23	26	50.2	0.77	4, 14, 15	63	12, 20	27	41.6	2.37
Westerville	5	73	23	21	49.3	0.95	9	70	23	22	40.9	1.35
Marion	7	73	23	21	47.2	0.97	9	67	{ 12, 20, 22, 24 }	25	39.5	2.10
Hillsboro'	2	72	23	27	50.8	1.24	9	70	20	24	41.7	1 83
Toledo	7	74	23	19	47.9	1.63	13	62	20	25	39.5	2.88
Bowling Green	7	80	23	20	49.9	1.82	3	65	27	23	40.7	3.00
Kenton	7, 13	67	17, 23	36	50.7	2.13	.....	.....	.....	.....	.....	.....
Urbana University	7	75	23	22	49.9	1.17	9	70	12	21	40.4	1.77
Bethel	1	78	23	26	50.5	1.13	9	70	12	22	41.0	1.08
Cincinnati	2	75	23	30	52.5	1.22	.....	.....	.....	.....	.....	.....
Do	5	86	23	34	57.4	1.10	8, 16	70	20	30	46.6	1.16
College Hill	2	75	18, 23	30	57.7	1.19	9	72	19, 20, 24	28	43.2	1.80
Jacksonburg	2	76	23	28	52.7	1.69	9	72	12, 20, 23	26	43.0	2.25
Averages	.....	.....	.....	.....	50.8	1.20	.....	.....	.....	.....	41.5	2.34
MICHIGAN.												
Monroe City	27	68	22	20	40.8	1.07	3	54	6, 27	18	34.1	3.61
State Agric. College	5	69	23	12	45.2	1.11	.....	.....	.....	.....	.....	.....
Litchfield	30	68	17	22	44.6	1.60	3	60	27	21	37.8	2.67
Grand Rapids	30	70	17	24	44.9	.....	13, 14	54	19	21	36.5	.....
Northport		60	22	23	43.1	3.00	3	46	30	24	35.4	3.78
Holland	10	66	22	25	45.3	1.06	14, 15	57	18, 19, 27	25	38.2	5.20
Otsego	10	70	22	24	45.1	.....	8	66	23	26	39.4	.....
Copper Falls	4	62	28	20	36.7	2.87	2	46	30	15	31.3	3.55
Ontonagon	4	64	17	28	43.3	.....	3, 7, 18	46	27	24	36.2	3.60
Coldwater	5, 30	68	23	20	44.7	1.31	15	60	18, 27	22	36.7	3.69
Muskegon		70	23	24	45.2	2.20	3	60	26	24	38.4	3.00
Averages	.....	.....	.....	.....	43.5	1.78	.....	.....	.....	.....	36.4	3.64
INDIANA.												
Aurora	1	80	23	26	52.5	1.05	.....	.....	.....	.....	.....	.....
Vevay	2, 7	80	18	30	54.9	1.30	9	78	23, 27	28	44.1	1.73
Muncie	6	75	17, 23	27	50.4	1.75	15	66	12, 24	23	41.9	2.77
Spiceland	2, 5, 7	73	23	26	50.2	1.20	9	67	12, 24	25	41.0	1.46
Jalapa	30	74	22	29	50.0	0.75	9, 16	62	12	28	42.5	4.43
Indianapolis	7, 30	71	23	26	50.5	1.16	14	67	24	25	41.5	1.29
State University	2, 7	72	18	32	51.6	.....	8. 9	70	12, 27, 29	26	42.1	1.34
Rensselaer	26, 30	71	17	30	51.9	2.50	3, 6	62	{ 1, 17, 18, 23, 27 }	26	38.9	5.45
Merom	2, 5	76	17, 23	32	54.3	1.35	8	71	11	27	42.6	1.79
New Harmony	2, 7	76	23	33	55.4	1.31	8	75	23, 27	28	44.6	1.96
Knightstown	.....	.....	.....	.....	.....	.....	9	70	12	24	42.3	1.87
Averages	.....	.....	.....	.....	52.2	1.37	.....	.....	.....	.....	42.2	2.40
ILLINOIS.												
Chicago	26	74	8	37	52.9	1.69	3	62	18	26	41.9	2.60
Near Chicago	10, 26, 30	74	17	30	50.2	.....	3	60	19	12	34.3	.....
Ridge Farm	30	75	23	30	51.5	1.40	.....	.....	.....	.....	.....	.....

Table showing the range of the thermometer, &c., for Oct. and Nov.—Continued.

States and stations.	October, 1868.						November, 1868.					
	Date.	Max. temp.	Date.	Min. temp.	Mean temp.	Rain fall.	Date.	Max. temp.	Date.	Min. temp.	Mean temp.	Rain fall.
ILLINOIS—Cont'd.		°		°	°	*In.*		°		°	°	*In.*
Marengo	30	69	17	17	45.2	1.30	13	62	18, 19	18	36.2	3.18
Golconda	6	89	23	29	66.8	1.10	9	80	12	22	51.9	1.00
Aurora	26	72	17	25	46.2	2.07	3	58	19	13	37.6	2.55
Sandwich	30	72	17	21	46.1	0.95	.....	.....	.....	.....	.....	.....
Belvidere	26	76	17	24	45.8	0.65	4	61	18	14	36.5	3.36
Winnebago	26	75	17	19	45.6	0.80	3	60	18	11	35.6	3.34
Rochelle	36	75	17	18	46.2	.....	3	66	19	10	36.2	.....
Wyanet	1	79	17	22	49.0	1.24	3	70	22	15	39.2	3.57
Tiskilwa	26	72	17	22	48.9	.....	15	62	19	20	39.3	.....
Hennepin	26	78	17	24	51.0	.....	3	64	19	20	38.0	.....
Elmira	26	74	17	24	49.6	0.20	3	64	19	20	38.5	3.20
Peoria	26	77	17	29	51.9	1.41	3	65	17, 19	25	41.3	4.50
Springfield	6	80	8, 9, 17	36	51.6	.....	3, 8	70	17, 18, 20	26	41.1	.....
Loami	.....	.....	.....	.....	.....	.....	7	70	17	22	41.0	5.15
Dubois	5	78	10	24	47.8	1.30	4	65	11	20	40.3	1.52
Waterloo	26	77	8	32	57.1	.....	8	73	19	29	46.4	.....
Lombard Univ'ty	26	75	8, 17	27	48.6	1.14	8	66	17, 18, 19	25	40.4	3.74
Manchester	26	81	17	29	53.3	1.44	7	72	17	23	42.1	3.12
Mount Sterling	6, 25	73	17	28	53.5	.....	7	75	11	24	41.8	.....
Andalusia	5	70	17	26	50.2	.....	3	60	11, 19	24	39.9	.....
Augusta	5	70	17	26	52.2	1.76	3, 15	61	19	25	40.8	5.02
Averages	.....	.....	.....	.....	50.5	1.23	.....	.....	.....	.....	40.0	3,28
WISCONSIN.												
Manitowoc	5	64	17	25	43.3	2.31	3	57	18, 27	22	36.0	3.04
Plymouth	4	66	17	20	42.0	2.80	3	54	27	17	32.8	4.40
Hingham	5, 27	65	17	20	44.8	.....	3	58	18	17	35.5	.....
Milwaukee	4	67	22	21	45.6	1.18	4	65	18	20	37.0	3.23
Appleton	5	61	17, 22	25	43.1	.....	3	57	27	21	36.4	.....
Geneva	26	72	17	21	45.9	1.35	3	62	18	18	36.1	5.70
Waupacca	4	72	17	22	44.1	.....	3	58	13, 18, 27	20	35.5	.....
Embarrass	5	64	17	20	42.1	2.51	3	56	27	16	31.4	3.53
Rocky Run	4	71	17	17	45.2	1.53	3	60	27	16	34.6	4.94
Edgerton	26	72	17	18	46.5	3.00	3	62	18	16	36.9	.....
Averages	.....	.....	.....	.....	45.2	2.15	.....	.....	.....	.....	35.2	4.14
MINNESOTA.												
St. Paul	4	77	17	16	43.6	4.56	2	57	11	10	31.1	3.68
Minneapolis	4	78	17	19	42.7	4.92	2	59	27	10	30.5	4.13
Sibley	26	70	17	14	43.1	2.25	2	60	27	3	31.3	3.00
New Ulm	4	79	22	23	47.0	2.66	2	62	27	8	32.4	3,73
Sauk Center	4	76	17	14	41.1	1.49	2	57	26	3	27.5	2.73
Averages	.....	.....	.....	.....	43.5	3.18	.....	.....	.....	.....	30.6	3.45
IOWA.												
Clinton	26	80	17	32	52.2	1.20	13	64	18	14	41.0	4.45
Davenport	26	72	17	24	47.8	2.64	.....	.....	.....	.....	.....	.....
Dubuque	26	74	17	27	47.1	1.31	3	60	18	17	37.3	1.18
Monticello	25	75	16	26	45.6	0.65	3	62	11, 17	18	36.4	2.05

Table showing the range of the thermometer, &c., for Oct. and Nov.—Continued.

States and stations.	October, 1868.						November, 1868.					
	Date.	Max. temp.	Date.	Min. temp.	Mean temp.	Rain fall.	Date.	Max. temp.	Date.	Min. temp.	Mean temp.	Rain fall.
IOWA—Continued.		°		°	°	*In.*		°		°	°	*In.*
Bowen's Prairie	26	72	17	22	49.0	1.26	2, 15	60	17	18	36.2	4.50
Muscatine	.....	.....	.....	.....	.....	.....	3	61	19	21	38.1	2.71
Fort Madison	30	72	17	25	51.0	1.83	3	65	11, 17	22	42.2	4.02
Guttenberg	26	78	17	16	43.1	.....	3	62	27	12	34.5	.....
Mt. Vernon	26	71	17	19	46.1	.....	14	62	11, 17	18	36.3	.....
State Univesity	1, 26	73	17	25	49.8	0.33	2, 3	63	17	18	38.0	4.38
Independence	26	77	17	16	.....	1.70	2	62	27	14	34.5	1.90
Near Independence	26	76	17	22	46.4	0.06	14	63	27	10	31.9	2.70
Waterloo	26	78	17	14	46.0	.....	2, 3, 14	62	26	14	36.2	.....
Marble Rock	4, 24	70	17	24	47.2	.....	14	54	27	19	34.3	.....
Algona	4	80	8	22	45.2	.....	2	64	11, 26	12	31, 1	.....
Near Algona	4	81	17	19	45.0	.....	.....	.....	.....	.....	.....	.....
Fort Dodge	26	73	17	19	46.6	1.20	2	64	17	18	32.9	1,04
Boonesboro'	25, 26	74	17	20	48.1	0.24	2	64	27	13	33.1	1.52
Rolfe	4	84	22	25	46.7	1.25	2	71	27	7	31.3	1.65
Fontanelle	26	77	17	19	49.0	1.13	14	67	17	14	35.3	1.48
Logan	4, 6	76	17	22	49.4	.....	2	72	27	10	33.6	2.40
Woodbine	6, 26	74	8	18	46.4	.....	2	70	27	10	33.7	.....
Averages	.....	.....	.....	.....	47.9	1.31	.....	.....	.....	.....	35.4	2.57
MISSOURI.												
St. Louis University	5	75	17	33	55.7	1.97	8	73	19	31	45.7	1.90
Allenton	26	83	8	31	54.4	1.90	3, 8	77	23	18	42.9	2.01
Hematite	25	84	9	28	57.3	1.80	8	78	23	19	46.4	2.05
Canton	10	73	8	27	51.8	2.37	3	66	11, 27	26	40.9	5.01
Rolla	5	78	9	32	55.4	1.34	8	75	23	20	42.9	1.47
Jefferson City	25	80	8	30	54.0	.....	7	79	19	26	46.0	.....
Hermitage	6	88	8	30	56.7	1.47	8	81	22	20	42.0	3.35
Warrensburg	6	83	8	28	58.2	2.05	7	73	16	23	42.9	5.01
Harrisonville	6	86	8	28	53.8	2.53	3	72	17, 19, 20	20	40.5	6.20
Oregon	25	83	8, 22	29	55.1	1.68	2	78	19, 26, 27	19	39.1	3.05
Averages	.....	.....	.....	.....	55.2	1.90	.....	.....	.....	.....	42.9	3.34
KANSAS.												
Leavenworth	6	84	8, 22	24	52.3	1.71	2	74	26	16	37.9	5.17
Baxter Springs	5	86	8	34	60.8	2.15	.....	.....	.....	.....	.....	.....
Atchison	6	84	8, 22	28	54.5	8.80	2	78	26	17	38.8	8.40
State University	6	81	22	27	53.1	1.58	2	73	26	17	38.0	4.14
Holton	6	83	22	25	52.4	.....	2	77	26	15	37.7	.....
State Agric. College	6	79	8	32	53.1	2.51	2	71	26	16	38.1	2.72
Council Grove	6	84	22	31	57.7	3,05	2	78	27	20	42.3	3.45
Averages	.....	.....	.....	.....	54.8	3.30	.....	.....	.....	.....	38.8	4.78
NEBRASKA.												
Elkhorn	4	82	7, 17	28	50.6	.....	.....	.....	.....	.....	.....	.....
De Soto	4	81	8	20	49.5	2.17	2	70	26	10	33.3	1.18
Fontanelle	4	88	17	25	52.2	1.60	.....	.....	.....	.....	.....	.....
Bellevue	25	82	8, 17	33	52.5	1.30	2	71	27	17	37.1	0.50
Glendale	4	85	7, 21	25	49.7	1.90	2	75	27	9	33.9	1.90

Table showing the range of the thermometer, &c., for Oct. and Nov.—Continued.

States and stations.	OCTOBER, 1868.						NOVEMBER, 1868.					
	Date.	Max. temp.	Date.	Min. temp.	Mean temp.	Rain fall.	Date.	Max. temp.	Date.	Min. temp.	Mean temp.	Rain fall.
NEBRASKA—Con'd.		°		°	°	*In.*		°		°	°	*In.*
Dakota	2	90	17	22	48.7	.....	2	68	27	7	34.1	.....
Nebraska City	4.6	80	17	33	53.5	6.47	2	71	16, 17, 19, 27	20	38.1	2.10
Omaha	.....	.....	.....	.....	.....	.....	14	73	16, 17	18	37.3	.....
Omaha Agency	4	78	17	26	50.3	1.70	2	73	17	16	36.5	1.36
Averages	.....	.....	.....	.....	50.9	2.52	.....	.....	.....	.....	35.8	1.41
UTAH TERRITORY.												
Wanship	3	75	8	21	54.7	.....	.....	.....	.....	.....	.....	.....
CALIFORNIA.												
Monteray	10	90	30	41	57.1	0.55	.....	.....	.....	.....	.....	.....
Murphy's	8, 9, 10	84	16, 19, 28, 30, 31	32	56.3	0.12	.....	.....	.....	.....	.....	.....
Averages	.....	.....	.....	.....	56.7	0.34	.....	.....	.....	.....	.....	.....

NOTES ON THE WEATHER—OCTOBER, 1868.

Steuben, Me.—Rain turning to snow on 17th, four inches laid; windows frosted as in winter 18th; much snow still on ground 24th; month colder than usual; potatoes caught by snow.

West Waterville, Me.—Robin seen 10th; snow, two inches, 17th; ground frozen two inches deep 18th; month dry and cold; temperature 2.38° below usual average.

Gardiner, Me.—October unusually cold, nearly 4° below average of 32 years, dryest October on record, except in 1839, when rain-fall was 0.41 inch, in 1859; 1.08 inches.

Standish, Me.—Frost 7th and 10th; snow 17th; ground, and apples on trees, frozen hard, 18th; last part of month cold and rough, ground frozen every morning since 17th.

Norway, Me.—Snow 17th and 21st; the coldest October in several years.

Cornishville, Me.—October temperature of last 39 years averaged 46°; this October, 42.9°.

Lisbon, Me.—Ground frozen hard on 24th, 25th, 27th, 29th, 30th, and 31st; th cold, very little pleasant weather.

Antrim, N. H.—First snow 17th; the coldest October in several years.

Stratford, N. H.—Half inch snow 17th; the month cold and dry.

Goffstown Centre, N. H.—Month peculiarly severe; frost on 3d, ice on 7th, six inches snow on 17th; ice nearly 1½ inch on 18th, freezing thousands of bushels of apples on trees, and many potatoes in heaps and under ground.

Shelburne, N. H.—Ground frozen 10th; an inch of snow 17th; many springs dry and rivers lower than at this season in 20 years.

Lunenburg, Vt.—A raw windy month, but crops harvested in good condition.

Randolph, Vt.—One-half inch snow on 9th; hard freeze 10th; two to three inches snow 21st and 22d; month very dry, with much cloudy weather.

Woodstock, Vt.—First snow 17th; five inches snow on hills 21st and 22d.

Kingston, Mass.—Snowed nearly all 17th, melting as it fell; a killing frost on 18th.

Topsfield, Mass.—Snow-storm on 17th; month closes cool.

New Bedford, Mass.—Foliage coloring and falling 1st to 11th; first snowflakes 17th.

Worcester, Mass.—Showers 1st, 2d, 3d, 14th, 15th; snow-storm 17th, whitening hills and followed by ice; frost and ice 24th, 30th, 31st.

Mendon, Mass.—First snow, an inch, 17th; ground frozen 18th; snow 23d.

Lunenburg, Mass.—Hard snow-storm 17th; coldest October since 1850.

Amherst, Mass.—Rain with snow 17th; snow with rain 22d.

Hinsdale, Mass.—Two or three inches snow 17th; snowed all day 22d, but much melted; snow 23d; month very cold and unpleasant.

Newport, R. I.—Flurry of snow reported 22d; first white frost 24th.

Pomfret, Conn.—Snow 17th, 23d; coldest October since 1859, when mean temperature was 44.37°; October average for last 16 years, 49.18°.

Columbia, Conn.—Rainy, 2d, 14th, 17th, 19th, 21st, 25th; snow melted as it fell 17th; ground frozen an inch 18th; an inch of snow 22d.

Colebrook, Conn.—Ground frozen 9th; snow, melting as it fell, 17th, 22d.

Waterbury, Conn.—Ground frozen first time 9th; snow flurry 17th.

South Hartford, N. Y.—October cold and wet; fall work retarded; several snow flurries; three inches snow.

Troy, N. Y.—First snow 17th, second 23d; temperature of month 4° below mean temperature of 12 last Octobers.

Newburg, N. Y.—Mountains white with snow 23d; ice, nights of 18th, 23d. 23d.

Deaf and Dumb Institute, N Y.—First ice 9th; first severe killing frost 18th.

Minaville, N. Y.—Ice, thick as window-glass 10th; one inch snow 17th; October had 2.2 inches snow.

North Hammond, N. Y.—Six inches snow 21st and 22d, remained four days; October cold; streams low; St. Lawrence river very low.

Houseville, N Y.—Hoar frost 1st; first snow 16th; copious rain 31st.

South Trenton, N. Y.—First snow 16th; ground frozen hard, 23d.

Depauville, N. Y.—Frost and ice 1st to 23d,; clear, with cold northeast wind, 17th; northeast storm 21st to 23d, rain, but most of time snow, till 2.5 inches laid; ice over an inch 23d. Before 21st ground was dry and ploughing difficult. On 31st gale all day, doing considerable damage.

Palermo, N. Y.—First killing freeze 17th; first snow 22d. The coldest October in 15 years, except 1865.

Volney, N. Y.—First frost 17th; first snow 22d; rain on 11 days, and frost on 9 mornings in October.

Nichols, N. Y.—Many rainy days but no heavy rain. Springs very low.

Buffalo, N. Y—Very light snow 17th, followed by severe frost; 2 inches snow 22d; no thaw in shade 23d; plenty of ice 24th. October colder than average of ten years by 3.4°, and less rain by an inch.

Newark, N. J.—First severe frost 9th; first ice 18th. Temperature more than 3° below 25 preceding Octobers. Much lowery weather, but not much rain.

Trenton, N. J.—Frosts 9th, 12th, 24th, and 25th; first snow 17th; first ice 18th.

Moorestown, N. J.—Rain and snow 17th; ice 18th; corn well ripened, grain sowed, and farmers ready for winter.

Elwood, N. J.—Only four frosts and not a flake of snow in the month.

Dover, N. J.—Month dry; the last day nearly as much rain fell as in September.

Haddonfield, N. J—Ice 18th, 23d, 24th, and 30th; ground frozen 24th and 30th.

Newfield, N. J.—Snow flakes 16th; freezing and frosts 18th, 24th, 29th, 30th, and 31st.

Greenwich N. J.—Mild until 17th; several frosts and some ice after that.

Vineland, N. J.—Month good for securing crops; first killing frost 18th.

Nyces, Pa.—Snow in air 17th; snow-squall 22d; on 31st gale ending in rain, and turning to snow November 1st.

Fallsington, Pa.—Rain or mist on 11 days; light frost 9th; hard frost and ice 18th. Fine weather for the season.

Horsham, Pa.—On 17th dark clouds north, then west wind, and snow flurry, followed by ice half an inch thick, killing vegetation.

Plymouth Meeting, Pa.—First snow 17th; first frost 18th; frost eight mornings and ice three mornings in October.

Dyberry, Pa.—Wild geese 9th; first snow 17th; snowy, after fine rain, 22d.

Whitehall Pa.—Frost on 4 mornings; cloudy and rainy 20 days in October.

Factoryville, Pa.—A few snow flakes, 17th and 22d. A cool, cloudy, dry month; 2.25° colder than four preceding Octobers.

Reading Pa.—A little snow 17th; frosts on five mornings, with ice two of them.

Tioga, Pa.—Severe snow-storm, 17th; ice an inch thick on 18th; apples on trees frozen hard; coldest October morning known here. First ten days pleasant; the rest, the reverse.

West Chester, Pa.—Vegetation not much hurt till 18th; many oaks in brilliant foliage, 28th; fringed gentian still blooming even on northern slopes 31st.

Fountain Dale, Pa.—First killing frost 8th; hard frost 29th; snow-flakes 22d. Month dry and pleasant, but few frosts; foliage still on most forest trees.

Grampian Hills, Pa.—October fine weather; four heavy frosts; trees bare, but pastures pretty good. Water low till heavy rain at the close of the month.

Johnstown, Pa.—First slight snow 17th; heavy frosts 18th, 24th, 29th, and 30th.

Franklin Pa.—First frost and ice 9th; snow and sleet 17th; very heavy frost 18th;

Newcastle, Pa.—Mean temperature about 4° lower than October average of ten years.

Canonsburg, Pa.—Leaves of hickory, maple, &c., coloring 1st; smoky 7th to 15th, and 27th to 29th; a few snow-flakes 23d.

Woodlawn, Md.—White frosts on ten mornings; ice on five; ground frozen on two; snow-squalls on 17th.

Emmittsburg, Md.—First freeze and ice, 9th; snow-squall 17th.

Surry Court House, Va.—The month mostly mild and pleasant, and one-half fair, rain on ten days. From frost to frost (April 6th to October 18th,) six months and 12 days.

Camorn, Va.—Indian summer for three weeks in October; frosts 18th, 24th, 29th, 30th.

Lynchburg, Va.—Frost, killing some tobacco, 9th; a severer one 18th.

Snowville, Va.—First ice and frost 9th; again 18th, 23d, 24th; frost only 25th, 29th, 30th. Sensible earthquake shocks on 10th, at 11.30 p. m. and 11th at 12.30 a. m.

Wytheville, Va.—Five light and five severe frosts; first snow-flakes 31st; weather favorable; corn very good, but slightly frozen; wheat looks more flourishing than for years.

Kenansville, N. C.—Very severe lightning and thunder 9th; cold northeast, storm 10th; killing frost 22d; wind easterly nearly all October.

Goldsboro, N. C.—First heavy frost in last of month; a few light ones prepcede it.

Albemarle, N. C.—First white frost 18th; injured pea and sweet potato vines; killing frost 28th.

Gowdeysville, S. C.—Light frost 18th, injured very tender plants.

Atlanta, Ga.—First hoar frosts, 23d, 24th, 25th, did not sear potato tops.

Opelika, Ala.—First frosts of season, 24th, 25th; tomato and sweet potato vines unhurt by frost. Between frosts, April 11th to October 24th, 195 days.

Carlowville, Ala.—October, one of our driest months, had over 17 inches of rain!

Moulton, Ala.—Slight frost in low grounds 8th, others 23d, 24th. October quite pleasant; little rain; sickness abated; roses still blooming.

Havana, Ala.—Slight frosts 9th, 23d, and 25th; cotton one-half to two-thirds usual crop; corn inferior to last year.

Jacksonville, Fla.—Average October temperature 70.75°; this year 2° higher. No frosts this month.

Gilmer, Texas.—First wild geese arrived 7th; first frosts 9th, 10th, 22d, 23d, 24th, only touching tenderest vegetation; field peas still in blossom.

Austin, Texas.—Grasshoppers appeared 4th; lightning and thunder 19th, 20th.

New Orleans, La.—Heavy rains with lightning and thunder 2d, 3d. From 2d to 12th the river rose 7 feet—unprecedented at this season. After 22d much pleasant cool weather, sultry before.

Grenada, Miss.—First frosts 10th, 23d, did not hurt cotton. But one copious rain, (on 30th,) and 6 light showers.

Brookhaven, Miss.—Crops light, and all gathered; vegetation yet fresh and green; wild geese passing; snow birds and ground sparrows singing; robin redbreast here.

Austin, Tenn.—First frosts 9th, 18th; first ice seen here, 23d.

Clarksville, Tenn.—Rains 7th, 16th, 18th, 19th, 20th, 21st, 27th, 30th, 31st. An unusual prevalence of northerly and easterly winds this month.

Memphis, Tenn.—First frosts 9th, 10th, 23d—22 days earlier than last year; October temperature 2.75° below last year. Foliage falling rapidly.

Pinegrove, Ky.—(Formerly at Chilesburg post office, but the observer's residence the same.) Heavy white frost with one inch ice 9th; slight frost 15th; frost, ice, and ground frozen, 23d.

Clinton, Ky.—Killing frost 9th; katydid heard last 15th.

New Lisbon, Ohio.—Hard frost 9th; first spit of snow, 17th.

Steubenville, Ohio.—A few snowflakes 17th; frost 24th, 30th; thunder storm 25th.

Painesville, Ohio.—The dryest October I ever knew; roads dusty as in August.

Cleveland, Ohio.—Hard frosts 9th, 18th, 24th; sprinkling of snow 22d.

Kelley's Island, Ohio.—October 6th, temperature of Lake Erie 60°; 21st, 52°; 31st, 48°; ice formed 17th, 23d. Mean date of first killing frost for 9 years, November 13th; this year October 17th, nearly a month earlier.

Sandusky, Ohio.—White frosts 4th, 6th; with ice 9th, 18th; slight snow 22d.

Toledo, Ohio.—Severe frost 4th; hail and sleet 18th; the 23d the coldest October morning on record.

Bethel, Ohio.—October 1st scattered oats among peach trees for winter protection; finished sowing wheat 3d; heavy frost 9th.

College Hill, Ohio.—The first part of October cold, the latter part pleasant.

Litchfield, Mich.—Ice 8th, 17th, 18th, 23d; the night of 22d the coldest of the season ever known here. The month very cold and very dry; many potatoes frozen in the hill.

Grand Rapids, Mich.—Hard freeze night of 17th, killing vegetation.

Northport, Mich.—Mild and mostly pleasant till 17th, when ice formed; slight snow and hail 18th, 21st, 22d, then mild till 27th, then a slight snow; also on 31st.

Holland, Mich.—Frost on 9 mornings; flakes of snow 16th, 18th.

Copper Falls, Mich.—A very stormy, unpleasant month; 13th 7 inches snow.

Vevay, Ind.—Dense setting fogs 6th to 11th, and 25th to 29th; rising fogs 12th, 13th, 26th, and 27th; heavy frosts with ice 17th, 18th, and 23d; and on 8th, 2 miles from the river.

Spiceland, Ind.—On the 29th counted 130 solar spots with telescope 6 feet long and 46 inches diameter. Month was generally pleasant.

Jalapa, Ind.—October weather beautiful; potato crop increased beyond expectation; corn, large crop, but grains light and chaffy.

Chicago, Ill.—Some snow 17th; first ice of the season 8th.

Ridge Farm, Ill.—Ice 0.3 inch and ground frozen 9th; ice half inch 16th, 23d. Very dry, roads dusty; corn ripe, but some injured by frost.

Marengo, Ill.—Froze to affect apples 17th, when temperature of well was 48°.

Golconda, Ill.—Light frosts 8th, 9th; heavy 16th. October very pleasant.

Aurora, Ill.—October colder with less wind than usual; crops all secured; much fall ploughing done.

Belvidere, Ill.—Much cloudy weather, little rain; less Indian summer than usual

Winnebago, Ill.—Rain with lightning 6th; lightning and distant thunder 30th. No snow.

Tiskilwa, Ill.—Very hard freeze 17th, ground froze 1 inch, and apple and pear leaves fell before night; Osage orange also, which in 15 years' acquaintance I never knew it to do. Forest leaves fell fully a month earlier than usual.

Hennepin, Ill.—Wood crickets and katydids silenced by the freeze on the 17th.

Dubois, Ill.—Indian summer 3d to 14th; first wild geese 7th; first killing frost 10th.

Mt. Sterling, Ill.—Wild geese flying westward 13th; first snow, very light, 18th; late corn and much fodder injured by frost.

Augusta, Ill.—Froze hard 8th; wild geese 9th, 27th; lightning, west, 30th.

Manitowoc, Wis.—Thunder storms 6th, 7th, 30th; distant lightning 29th.

Plymouth, Wis.—Lightning, thunder, rain, and snow 6th. October weather unsettled; very cool, few Indian summer days.

Milwaukee, Wis.—White frost 4th; hard white frosts 14th, 15th; ice half inch 17th; snow flurry 21st; ice on ponds 22d.

Waupacca, Wis.—Hard freeze 1st; rain and snow 7th; 2 inches snow 8th; snow squalls 18th, 21st.

Embarrass, Wis.—Hard frost and ice 1st; frost, followed by thunder, 4th, 6th; first snow 7th; hard frosts 8th, 12th, 14th, 16th, 17th, 22d, 28th; aurora, 14th, 16th, 17th, 22d; snow and sleet all day 18th; snow, hail, rain, lightning, and thunder 29th; distant thunder 30th, 31st. Month cold, wet, and unfavorable for fall grain.

Rocky Run, Wis.—Thunder, or lightning, or both, sometimes with rain, 1st, 2d, 7th, 14th; aurora 14th, 20th, 21st, 22d; frosts 3d, 16th, 17th, 18th, 21st.

St. Paul, Minn.—Snow 7th; 17th the coldest October day known here. Average mean temperature of October for 40 years, 47°; this year 43.59°.

Minneapolis, Minn.—Thunder storm for 20 hours on 29th and 30th.

Sibley, Minn.—Snow 7th, 17th; heavy thunder storm from 10 p. m. on 29th to 7 p. m. on 30th.

Sauk Centre, Minn.—Frost 1st; snow 7th, 27th, 30th; aurora 16th, 21st.

Clinton, Iowa.—Thunder storm 30th. On the whole a favorable month.

Dubuque, Iowa.—Wild geese 7th; mud frozen solid 8th; frosts 15th, 28th.

Monticello, Iowa.—Diffused lightning, north and west, 29th. Month pleasant.

Fort Madison, Iowa.—Month dry, springs low.

Guttenberg, Iowa.—Lightning and thunder with rain 6th, 30th; without rain 29th; snow 7th, 17th; Indian summer 7th till 12th. Finest month for ploughing I ever knew.

Independence, Iowa.—Frosts 1st, 15th, 17th; hard freeze 8th, 22d, 28th; light snow 17th; light thunder shower 30th.

Marble Rock, Iowa.—Rain and snow followed by freeze 7th; rain and snow 18th; thunder, rain, and hail 29th, 30th.

Algona, Iowa.—Rain, then snow, 7th; hail and snow 12th, then rain 13th; sleet and snow 17th, then rain 18th; lightning and thunder with little rain 29th, 30th, 31st. Crops all good.

Near Algona, Iowa.—Smoky 1st to 6th; frosts on 14 days, dense fogs on 4, rain on 4, and snow on 2; auroras 14th, 16th. Month remarkably cold and unpleasant; mean temperature 4.6° below October, 1867.

Boonesboro', Iowa.—Snow squalls 7th, 17th; freezes 8th, 17th; thunder storms 29th, 30th; beside 11 clear days, 11 smoky days, and 6 heavy fogs.

Rolfe, Iowa.—Furious thunder storm 6th; snow storm 7th; thunder storm 29th.

Logan, Iowa.—Frosts killed prairie grass about 20 days earlier than usual.

Fontanelle, Iowa.—Fogs 2d, 3d, 4th; smoky 5th, 6th, and 8th to 19th, and 27th to 31st; sleet and snow 7th; frost and ice 19th, 21st, 27th.

St. Louis, Mo.—High winds and thunder storm 7th; first frost 8th; heavy wind, then frost, at night, 17th. More than half the mornings in October were foggy until 8 a. m.

Allenton, Mo.—Thunder storms, morning and evening, 7th.

Canton, Mo.—Thunder storm 6th; first freeze, severe, 8th.

Rolla, Mo.—Thunder storm 7th; hard frost 8th; ice $\frac{1}{4}$ inch 9th; cold northeast storms 14th, 16th.

Warrensburg, Mo.—Foggy 1st, 2d, 3d, 15th, 19th, 20th; frost and ice 8th, 22d.

Harrisonville, Mo.—Distant diffused lightning 6th; ice 9th; thunder and lightning 13th.

Oregon, Mo.—Heavy fog 1st, 2d, 3d, 22d; lightning and thunder 6th, 14th, 20th; frosts 19th, 22d, 28th; ice 8th, 17th. A 6-pounder fired at Rockport, 35 miles distant, was distinctly heard here and 10 miles southeast of here—45 miles in direct line.

Leavenworth, Kansas.—Fogs 2d, 19th, 22d; continual lightning, north and northwest, at 9 p. m. 6th; sprinkle of snow 7th; thunder 13th, 20th; frosts 7th, 22d, 23d, 27th, 31st.

Holton, Kansas.—Grasshoppers hatching out 3d, eating wheat 24th; wild geese 5th; ice 8th, 17th, 22d; first buckfly (a fall butterfly) 10th.

Council Grove, Kansas.—On 13th tremendous dark clouds covered the northern sky, wind northeast, east, and west; the southern part half covered with mottled clouds; after half an hour's bluster a gentle rain, then a copious one. From 19th to 31st grasshoppers passing, 20 miles off, in every direction; they are laying eggs and eating every green thing.

Elkhorn City, Neb.—Frost 1st; mosquitoes 4th; ground frozen 8th; snowflakes 11th, 17th, 30th; month fine and mild.

Glendale, Neb.—Indian summer 1st to 7th; sleet and snow 7th; hail and rain 17th; October pleasant as usual.

Dakota, Neb.—Driving storm of rain, sleet, and snow 7th; snow 17th, 30th; prairie fires the last half of the month.

Nebraska City, Neb.—Rains from northwest, with lightning and thunder, 13th, 20th.

Wanship, Utah.—Thunder and thunder showers 1st, 2d, 16th; rain, followed by 1½ inch snow, 29th.

Harrisburg, Utah.—Rain and large hail 5th; killed fowls, destroyed vines and fruit-trees, and laid several days; after 5th pleasant; grasshoppers thick and ground full of eggs.

Monterey, Cal.—On 21st, 7.55 a. m., very heavy earthquake from northeast to southwest; a long, heavy shock; cracked adobe walls, stopped pendulum clocks, and set hanging lamps, &c., swinging; at 10 a. m. another slight shock, and at 2 a. m., on 22d, a smart shock.

Murphy's, Cal.—Thunder-shower 4th; slight hail 15th; earthquake at 8 a. m. on 21st, northwest southeast; lasted 5 to 6 seconds; no damage.

Cathlamet, W. T.—Greater part of month foggy and smoky; on 25th heavy rain; put out fires, and ended drought of 4 months.

NOTES ON THE WEATHER.—NOVEMBER, 1868.

NOTE.—We omit all notices of the meteoric display on the 13th to 18th for want of room, except in one or two cases where it is merely referred to in connection with other phenomena.

Lisbon, Me.—November cold and uncomfortable; ground frozen hard; good sleighing 10 miles north, but none here.

West Waterville, Me.—Rain of October 31st closed on 3d November with 3½ inches snow; sleighing 10th, (7 months since last sleighing;) snow-fall 19 inches in November, now 8 inches deep; mean temperature 3.69° below last four Novembers.

Gardiner, Me.—Lightning and thunder 5th; snow 8th, 10th, 24th, 26th; auroras 14th, 15th, 16th, 20th, 22d; a very cold, wet month; 2.38° below average temperature of last 32 Novembers.

Standish, Me.—Trees crushed with ice 10th; aurora 16th; sleighing 19th to 21st.

Norway, Me.—Heavy rains 1st to 3d, then snow; snow 8th, 18th; good sleighing all month after 8th; snow fall, 12.5 inches in November.

Cornishville, Me.—Snow 2d; aurora 16th; mean temperature of 40 last Novembers averages 33.33°; this month, 31.96°; November snow-fall 13 inches.

Concord, N. H.—We have had no Indian summer.

Goffstown Centre, N. H.—Ponds and streams closed 20th; ground now frozen 7 inches.

Shelburne, N. H.—Sleighing 9th to 18th; excellent sleighing after 18th; November snow-fall 18.8 inches.

Lunenburg, Vt.—Month wet; streams full; good sleighing after 19th.

Craftsbury, Vt.—Cold, cloudy month; good sleighing after 18th.

St. Albans, Vt.—First sleighing 18th; first good skating 28th.

West Charlotte, Vt.—Aurora 16th; snow storm 18th; good sleighing 21st; snow gone 30th.

Kingston, Mass.—Rain on 10 and snow on 3 days; remarkable auroral cloud in north-northeast on 14th, at 4 to 5 a. m., during meteoric shower.

Georgetown, Mass.—Fewer wild geese than usual, none seen early, some as late as 24th; streams full by the 11th; but little ice in ponds.

Milton, Mass.—A pleasant month, with Indian summer.

Worcester, Mass.—Rain on 6, snow on 2, and rain and snow on 3 days; aurora on 19th.

Mendon, Mass.—No snow; ground little frozen; grass in yards green; springs lower than usual this month.

Lunenburg, Mass.—Coldest November since 1858, (mean temperature 35.17°,) average mean temperature of November for 40 years, 40.19°; for November, 1867, 35.96°.

Richmond, Mass.—After the brilliant meteoric display of 13th, 14th, we had a few fine autumn days.

Newport, R. I.—First snow, melting as it fell, 5th; rain on 10 days.

Columbia, Conn.—Month quite warm; ground not frozen.

Waterbury, Conn.—On 19th, 10.30 p. m., aurora, white light, narrow streaks, gradually working westward by repeated vanishings and renewals.

Moriches, N. Y.—On 19th faint illumination, low in north, as from aurora. Before sunrise on 21st, lightning, and some heard thunder.

South Hartford, N. Y.—A rough month for out-door work, and farmers, therefore, ill prepared for winter.

Garrisons, N. Y.—Slight snow 1st; aurora 19th; month of very uniform temperature.

North Hammond, N. Y.—Rain 1st, 5th, 8th, heavy 9th, 10th; sleet 17th, and snow 18th; remained on ground till 23d.

Depauville, N. Y.—Thunder 10th; snow 11th; Indian summer 13th, 14th; month even in temperature; 26 days varied only 5° from monthly mean, which was 2.75° below the average of last four Novembers.

Palermo, N. Y—The coldest autumn and November in 15 years; this fall had five inches snow, and 11.7 inches rain.

Nichols, N. Y.—The rainiest November in many years.

Buffalo, N. Y—Snow on five, rain on nine, and frost on four days; mean temperature 2.1° below November average for 10 years.

Newark, N. J.—A few snow-flakes on 2d, the only snow of the month. The average temperature of 25 Novembers, 43.27°; this November, 42.25°.

Moorestown, N. J.—Lightning and thunder south, at 6 p. m. on 20th.

Elwood, N. J.—Thunder all afternoon of 20th in southwest, and at 7 p. m. heavy thunder storm. A delightful fall; no severe cold; little rain, and only a few snow-flakes on 2d.

Dover, N. J.—Pleasant month; no snow to cover ground; only filmy ice, whereas last year we had skating on November 7th.

Newfield, N. J.—Crickets and grasshoppers heard on 10th; ground frozen 13th; thunder-storm of 20th followed by snow to whiten ground, 10 days earlier than last year. Mean temperature 3.5° below last November.

Greenwich, N. J.—Dandelion in bloom 8th; Indian summer 12th to 16th; aurora 19th; thunder-storm 20th; first snow on ground 21st.

Nyces, Pa.—Snow 1st, 2d, an inch; numberless shooting stars 17th, a. m.

Fallsington, Pa.—Lightning, south, 20th; snow-squalls 21st; fine November weather.

Philadelphia, Pa.—First ice in streets 12th; a few snow-flakes 21st.

Horsham, Pa.—Unusual amount of Indian summer this month; ground hardly frozen or whitened with snow.

Whitehall, Pa.—Only 10 fair days, 17 cloudy, and five rainy days.

Factoryville, Pa.—Month cold and wet; rain-fall since April 1st, 1868, 28.61 inches.

West Chester, Pa.—Snow 1st, 21st; ice 12th, 28th; aurora 19th; lightning and rain 20th. Farmers still pasturing their stock.

Fountain Dale, Pa.—Rain on 20th, turned to snow, here nine inches, on west side of the South mountain 16 inches on 21st. This November, like last, was mostly fine and seasonable, (except the very unusual deep snow,) and without the usual high west winds.

Harrisburg, Pa.—Rain and snow 1st, 20th; snow squalls 22d; rain on nine days.

Ickesburg, Pa.—Rain 12 days; snow 11th, 20th, 21st, 30th; lightning and thunder, 10th.

Grampian Hills, Pa.—Month cloudy; some rain; not stormy, with 5.5 inches snow.

Franklin, Pa.—Rainy 10 days; snow on eight days; heavy frosts on 3d and 4th.

Newcastle, Pa.—Mean temperature a few degrees below average; no Indian summer.

Tioga, Pa.—Lightning and thunder 10th; month very unpleasant.

Woodlawn, Md.—Frost six mornings; ice six; lightning and thunder 20th; ground white with snow 21st, 22d.

Surrey C. H., Va.—Shooting stars 5th, 7th, 9th, 12th, 14th; snow-birds 6th; alder and bright-eyed daisy in bloom 12th, 13th; first snow 20th; month fair and chilly.

Johnsontown, Va.—Heavy white frosts on 8 mornings—first snow spit, 20th.

Comorn, Va.—Month nearly all Indian summer; no severe cold; just rain enough; best corn for years; some wheat quite green and tillering finely.

Wytheville, Va.—First snow, slight, 1st—some flakes 20th. Remarkably pleasant month.

Romney, West Va.—First snow 20th; fine fall for farmers; crops all good, especially corn.

White Day, West Va.—Snow 19th, 20th—hail, snow, and rain squalls, 28th.

Albemarle, N. C.—The fairest, dryest month this year; weather excellent for farmers.

Gowdeysville, S. C.—Light earthquake on 3d at 6 a. m.; shook furniture in second story. White frosts and ice 11th to 16th; Indian summer after 29th; month clear and cold.

Opelika, Ala.—First killing frost and first ice 2d; (207 days since the last severe frost;) ice also on 18th and 21st.

Moulton, Ala.—White frost 19 mornings, ice 9 mornings, rain on 3 days, ground frozen on 21st; pleasant, healthful weather for securing crops.

Havana, Ala.—Frost and ice 2d, 18th, 21st; rain 9th, 10th, 24th, 25th.

Columbia, Texas.—Frosts 1st, 2d, 11th, 12th; continuous lightning northeast, afternoon of 15th.

Houston, Texas.—Frosts on 7 mornings; sun rose and set clear on 15 days.

Austin, Texas.—Frosts 5 days; lightning and thunder 15th.

Jacksonville, Fla.—First frost 2d, frost and ice 21st, 23d; winter gardening prosperous; English peas will be shipped north shortly.

New Orleans, La.—First frost, slight, 13th; ice in some localities 21st; aurora 20th; forests bare 30th; 14 severe frosts, some with ice, in November.

Grenada, Miss.—First killing frost 2d; also on 13 days; rain on 6 days, but only one that was copious.

Brookhaven, Miss.—First killing frost 12th; geese passing south 21st.

Clarksville, Tenn.—Very light first snow 19th.

Memphis, Tenn.—Fair days 19, cloudy 6, rainy 5, frost 15 mornings.

Pine Grove, Ky.—Hail and snow 1st; snow 19th, 20th, 21st, all slight.

Lexington, Ky.—First snow 19th, 20th, slight; heavy frosts on 9 mornings.

Clinton, Ky.—Earthquake at 2 a. m., on 14th, rattled windows and awoke sleepers to see meteoric shower. First snow 20th, slight; large breadth of wheat sown and looking well; corn crop finest ever seen here, selling at 30 to 35 cents; hog cholera in a few places; roads firm and dry.

Kelly's Island, Ohio.—Flurries of snow whitened ground 18th, 19th—an inch fell on 20th.

North Fairfield, Ohio.—Snow squalls 11th, 28th, 30th; snow all day 18th, 19th, all melted.

Westerville, Ohio.—Ground white with snow 19th—snowing moderately 20th.

Toledo, Ohio.—Snow, sometimes with rain or sleet, on 9 days; aurora very red 12th. November mean temperature lower than in 9 years, except in 1860.

Litchfield, Mich.—First fall of snow 17th and 18th. November very dry for the season.

Northport, Mich.—Worst fall in 17, if not in 19, years, and November, like September and October, cold, windy, and wet. Buckwheat not harvested—some potatoes yet in ground.

Holland, Mich.—Snow on 8 days, sometimes with rain.

Copper Falls, Mich.—Month very stormy and unpleasant; sleighing for last three weeks; 29½ inches snow fell in November, 16 inches remain; winter a month earlier than usual.

Vevay, Ind.—Light first snow 19th; 14 heavy frosts in November.

New Harmony, Ind.—Very slight first snow 20th.

Knightstown, Ind.—Leaves all fallen 1st; very light snows 10th, 18th, 20th, 28th.

Chicago, Ill.—Heavy frost and first ice 2d; snows 11th, 30th.

Aurora, Ill.—First snow squall 17th; month colder than usual, but good for gathering corn crop and ploughing.

Tiskilwa, Ill.—Snow squalls all day, 1st, 17th, whitened the ground.

Hennepin, Ill.—Weather generally favorable; a few snow-flakes; potatoes gathered, corn nearly so.

Manchester, Ill.—Distant thunder on evenings of 6th, 7th; hard frost 23d.

Mount Sterling, Ill.—Month mild and favorable for farmers.

Augusta, Ill.—Lightning all night, with distant thunder, 7th; first snow, just covered the ground, 17th.

Manitowoc, Wis.—Distant lightning southwest and southeast on 14th, and southeast on 15th, both at 5 a. m.

Plymouth, Wis.—Vivid lightning and distant thunder in east, early morning 14th. No sleighing yet.

Milwaukee, Wis.—Rainy 7th, 8th, 9th; snow flurries 10th, 18th—an inch snow 17th.

Embarrass, Wis.—Bright aurora 3d; faint aurora 10th; ground frozen hard 18th; November very cold, with much rainy and cloudy weather; snow-fall, 11 inches.

St. Paul, Minn.—The fall, as a whole, was more wet and unpleasant than in many years. Snow-fall in November, 10 inches.

Minneapolis, Minn.—Snow, 6 inches, 9th; first ice in Mississippi river 11th; skating on ponds 21st.

New Ulm, Minn.—Minnesota river thick with snow and ice 16th; frozen over 17th; not yet crossed by teams 30th.

Sauk Centre, Minn.—Faint auroras 20th, 25th, 26th; nearly a foot snow on ground—18 inches in November; lakes frozen 3 to 4 inches.

Clinton, Iowa.—Month uniformly low temperature—not very cold—mostly cloudy and quite damp.

Dubuque, Iowa.—Frequent lightning in south, and afterwards thunder, 7th.

Monticello, Iowa.—Diffuse lightning and thunder southwest, evening of 7th; first snow, 2 inches, 17th, (24 days earlier than last year;) farmers ploughing 30th.

Muscatine, Iowa.—First snow 10th; many wild ducks 29th; snow-fall, 2 inches.

Bowen's Prairie, Iowa.—First snow 17th; month cold and unsettled; much corn not yet gathered.

Guttenberg, Iowa.—An unpleasant month for farmers and farm stock. A 23-years' resident says the Mississippi was never before so high at this season.

Independence, Iowa.—Month began and ended fair and pleasant, but for 12 days there was not a ray of sunshine visible.

Marble Rock, Iowa.—Beautiful till 7th, rainy and snowy till 11th, cold and cloudy till 25th, beautiful ever since.

Algona, Iowa.—Mostly rainy and snowy from 7th to 24th, since then pleasant; snow gone and river open.

Boonesboro', Iowa.—Sun shone but two brief intervals between 15th and 26th. November had 14 days entirely cloudy, 9 clear, 6 snow, mist, or rain, 3 smoky; temperature 6 75° below November, 1867, and 1.39° below the average of 13 years.

Rolfe, Iowa.—Thunder storm to northwest, and then snow storm from northwest, 15th; streams frozen 17th; ground now frozen 6 inches deep.

St. Louis, Mo.—First snow, a few flakes, 17th; snow 19th.

Rolla, Mo.—Month a trifle cooler than last year, but extremes less; range last November 89°, this November only 55°.

Hermitage, Mo.—November steadily cold, but no extreme, as in 1867, when thermometer sank to 8° below zero on 30th.

Warrensburg, Mo.—Mild and smoky till 8th; first snow, slight, 9th.

Oregon, Mo.—Diffuse lightning and heavy thunder 8th a. m.; ground frozen an inch 10th; heavy thunder, no lightning seen, 15th; 19th to 29th, thawing, snow and ice, roads very muddy.

Leavenworth, Kansas.—Sharp lightning with rain 8th; snow 9th; thunder storm 15th: from 14th to 25th, dull, cloudy weather, longest spell ever known here.

Atchison, Kansas.—Heavy thunder storm 15th; Missouri river full of floating ice 19th; coldest November in 5 years; snow-fall, 10.4 inches.

Lawrence, Kansas.—First snow 9th; (earliest winter since Kansas was settled;) sudden snow on 16th caught farmers all unprepared; one third of potato crop not gathered; snow-fall 6 inches, more than in all last winter.

Holton, Kansas.—Since 15th the worst November I ever saw here.

Council Grove, Kansas.—Roses, snowballs, and Wilson's strawberries blooming and fruiting on 1st, but latter lack color and flavor; fine hail and rain 9th; ground frozen 10th; 12 inches snow 23d, the deepest snow since admission as a State, yet this November is 3° warmer than any in same period; splendid weather, "bating the snow," 30th.

De Soto, Neb.—Snow ending in rain 9th; distant thunder storm 15th; violent snow storm 16th; Missouri river frozen over 20th.

Glendale, Neb.—Change on 16th from almost summer to midwinter, with 4 inches snow and fierce, chilly winds; 16th to 25th no sunshine, except a glimpse or two on 18th; very unusual weather here.

Dakota, Neb.—Severe snow storm 15th, 16th, 17th; Missouri river frozen over 18th, 12 days earlier than last year; this November 5.69° colder than last; only a light snow last November—this, 13.75 inches.

Omaha, Neb.—First snow 9th; ice 10th, with report of 4 to 6 inches of snow west; warm rain 15th, changed to driving rain from northwest, and violent snow storm on 16th to afternoon 17th; drifts 10 feet high; navigation closed 18th; passengers and mails crossed the Missouri on ice 20th.